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# **CARTERS PRACTICAL GREENKEEPER**



**CARTERS TESTED SEEDS INC.**

**25 WEST FORTY-THIRD STREET**

**NEW YORK, U. S. A.**



BY APPOINTMENT

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By Carters Tested Seeds, Inc.

FOURTH AMERICAN EDITION

# The PRACTICAL GREENKEEPER

BY  
REGINALD BEALE, F.L.S.  
AND OTHER EXPERTS.



PUBLISHED BY

**Carters Tested Seeds**  
INC.

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Photo by Levick

**DURING THE WOMEN'S CHAMPIONSHIP AT MAYFIELD**

The turf at the Mayfield Country Club, Cleveland, Ohio, produced under the Carter System, has given unqualified and consistent satisfaction.

# The Carter System

Business houses may be roughly divided into two classes, those who sell and don't care, and those who sell and *do* care. We belong to the latter class, and we want Golf Committees to understand fully that whether they are our customers or not, our services are at their disposal. Those who avail themselves of our services will on no account be importuned for orders. Our first object is the production of fine turf, and we feel that we have the right to claim to be experts in its production and maintenance, for many reasons, some of which are as follows:

1. We demonstrated at the Detroit Country Club and at the Mayfield Country Club of Cleveland, at Sunningdale and Walton Heath in England, that a first-class golf course can be produced from seed on waste land within one year from date of seeding.
2. We are responsible for a vast improvement in the condition of heavy inland courses by our discovery of a substance which at the same time destroys the worms and improves the turf.
3. We produced the first permanent English turf from seed in the United States for the Country Club, Brookline, Mass.
4. We have inspected most of the well known courses, and are responsible for the production of a large majority of the new courses in America and Europe.
5. We have supplied nearly one thousand golf clubs with seed fertilizers and Rex Humus which have invariably given entire satisfaction.
6. Our PRACTICAL GREENKEEPER, published in London and New York, was the first book devoted solely to the art of greenkeeping. It has been regarded as a text-book for the last twenty years, and will be sent POST FREE TO CHAIRMEN OF GREEN COMMITTEES, PROFESSIONALS AND GREENKEEPERS, on application.

## GOLF COURSE CONSTRUCTION

We specialize in golf course construction along the most up-to-date lines. Our methods are scientific and economical. We produce a course to suit modern requirements and ready to play, in the shortest possible time. Our staff is composed of the foremost architects and turf engineers in the country. We invite inspection of the courses we are now building, among which are the following:

Royal Montreal Golf Club, Dixie, Quebec.  
 Olympia Fields Country Club, Matteson, Ill.  
 Lakeview Country Club, Toronto.  
 Green Valley Country Club, Roxborough, Pa.  
 Moon Brook Country Club, Jamestown, N. Y.  
 East Liverpool Country Club, East Liverpool, Ohio.  
 Ottawa Hunt & Motor Club, Ottawa.  
 Battle Creek Country Club, Battle Creek, Mich.  
 Guyan Country Club, Huntington, West Virginia.  
 Country Club of Atlantic City, N. J.  
 Linwood Country Club, Atlantic City, N. J.

## CONTRACTS

We submit specifications and make contracts for the construction of golf courses on any class of soil, or for the remodelling of old courses or putting greens, on modern lines.

## SERVICE DEPARTMENT

We are prepared to send one of our experts to inspect and report on sites for new golf courses, or on proposed alterations of existing courses. No fee, other than expenses, is charged, an estimate of which will be furnished on request. We are also ready to advise by mail on any subject appertaining to the making or maintenance of a golf course.

*Carters Tested Seeds, New York, London, Toronto*

# The Modern Golf Course

## THE SELECTION OF A SITE

The ever-increasing enthusiasm for the Royal and Ancient game has created a demand for new golf courses, which is not easy to supply. Climatic conditions in America are not what they are in Great Britain, where the finest grasses grow naturally by the sea, and where the selection of a suitable site is an easy matter. On this side of the Atlantic conditions are very different, and the problems that enter into the selection of a piece of property for a prospective golf course are many and intricate. They may be roughly divided into two classes, those which the committee alone can answer, and those which concern the suitability of the soil for a golf course. In the former class there is the question of cost of the property, its proximity to easy means of transportation, its subsequent value with relation to the development of residential areas, and so forth. In the latter class the problems deal with the configuration of the ground, the condition of the soil in relation to fine turf production, the water supply, and above all, its natural advantages which would make for economy in building.

## THE CHOICE OF AN ARCHITECT

In the evolution of golf courses from the old to the new, the necessity of designing to meet modern requirements is not always appreciated, and for this reason care should always be taken in choosing an architect, not to employ one who has not as yet divorced himself from old-fashioned methods.

Golf architecture today consists of something more than the mere laying out of eighteen holes. Players want something more than good golf holes. They demand that apart from meeting the requirements of modern golf, the course must be so designed that the natural features of the locality be utilized and brought out, and that the surroundings be made as attractive as possible, from the point of view of the landscape architect.

The modern golf architect must be a man of originality and resource, a man who has studied much. The *art* of golf architecture is a gift of nature, but the *science* of golf architecture is only acquired by much study. The man who combines art and science is not easy to find, but he does exist, and he is the man that should be chosen to convert the newly acquired property into a golf course that is a golf course.

## THE CONSTRUCTION OF THE COURSE

There are few people who appreciate the difficulties and cost involved in constructing an up-to-date course. Unless nature has provided an ideal climate and soil, the fine grasses will not thrive naturally, *but they can be made to thrive*. Obviously it is impossible to create an ideal climate, but one can produce an ideal soil, in which the fine grasses will thrive and defy the climate.

Then, again, the modern green is very different to its predecessor of some years back. In the old days a green was merely built into the fairway, or worse still, a piece of the fairway was taken, top-dressed, and *called a green*. Such methods would never do nowadays. The modern green is nearly always built up to meet the approach shot, and even in cases where the contour of the ground lends itself to the formation of a natural green, a proper foundation must be laid, and the green built up to ground level.

The moulding of a golf course and the production of turf call for a deep and comprehensive knowledge of grasses and their diseases, of drainage, of labor distribution, of landscape gardening; they call for the services of a specialist, and the services of a specialist, whether he be doctor or turf engineer, command a high price. But money spent on the construction of the course, high though the initial cost may be, is money well spent, and will be more than saved in the subsequent maintenance of the course.

## MAINTENANCE

Assuming that golf committees are content only with the best, the relation between sound construction and economical maintenance cannot be too strongly emphasized. Once a green is built, poor drainage or inadequate soil cannot be successfully remedied without tearing up the whole green and rebuilding it. Greens have been built for a few hundred dollars which have cost thousands in upkeep in a few years. Parsimony in construction is not economy.

Leaving out the routine work of mowing and watering, of top-dressing and bi-annual seeding, the items of upkeep are many and varied. The overcoming of rot, caused by poor drainage; continuous watering, made necessary by over-drainage or lack of moisture retainers; the correcting of toxic conditions of the soil which promote parasitic and fungus diseases; the eradication of weeds, worms and other pests. Sound construction will minimize the cost of these items.



# The Making of a New Golf Course

## 1. The Greens

In the construction of a modern putting green, there are three absolutely essential factors to be considered. These are proper drainage, the condition of the sub-soil, and the texture and structure of the top soil. If these factors are right, the production of good healthy golfing turf is assured, and if the proper amount of plant food is incorporated in the top soil before the turf is established, the upkeep is made more simple, and from a financial standpoint, considerably cheaper.

### DRAINAGE

Proper drainage of a green is a necessity. Good healthy turf will not thrive where water makes the ground soggy or becomes stagnant under the top soil. Under such conditions the physical condition of the soil is changed, the chemical action of plant food stopped, and the maintenance of good turf made impossible.

Drainage is a comprehensive subject, and one that cannot be treated lightly, and these notes should only be used as a base upon which to formulate a scheme to suit the particular case under consideration. It is quite impossible to make hard-and-fast rules to suit all situations and formations of soils.

Land drain pipes are perhaps the most popular for draining grass land, and these should be laid in herring-bone formation, using 4-inch piping for the main drain, and 2 to 3-inch for the subsidiary drains. The pipes should be laid in trenches from 18 to 24 inches deep, the subsidiary drains being about 10 to 15 feet apart, and entering the main drain at an angle of about 45 degrees, so as not to arrest the flow of the water. It is advisable to fill partly the trenches with clinkers or other porous material, in order to increase the effectiveness of the drain, especially in clayey land.

The depth of the drain, the size of the pipes and their distance apart, being entirely dependent upon the character of the soil and general local conditions, must be decided by the person doing the work. Draining by means of pipes should be completed several months before any attempt is made to sow grass seed, as the soil in the trenches is bound to sink to a certain extent, and unless this can be corrected before the green is finished, the putting surface will be spoilt.

### SUB-SOIL

After the drains have been properly laid, they should be covered with a layer of small stones or clinkers, which should in turn be covered with at least a foot of natural soil and cinders mixed, after which the desired undulations of the green should now be made. To complete the sub-structure of the green, a moisture-content layer, consisting of half-rotted manure and humus (see page 19) should be added, or if manure is not available, of humus alone.

### TOP-SOIL

The green is now ready for the top-soil, and in order to produce and maintain good healthy golfing turf, it is necessary to have a sufficient depth of well proportioned porous top-soil in order that the roots of the grass may have both air and moisture. Both are as essential to plant life as a sufficient amount of plant food.

This life-giving top-soil should be composed of humus (see page 19), the natural soil, and good sharp sand. The ingredients of this compost should vary according to the nature of the existing soil. Should the soil be too light and poor, or too heavy, to carry a fine close turf, as is the case when dealing with very sandy or very heavy clay soils, an effort should be made to balance the ingredients of the compost to bring the porosity up to the standard required.

### PREPARING THE SEED BED

Prepare the seed bed by breaking up the clods, removing large stones, and all weed roots with an iron toothed rake; then roll, rake, and tread the ground until the surface becomes quite firm, true, and fine, and, when walked on, hardly shows the imprint of the foot.

### FERTILIZING

This is a most important operation in the making of a new green, and we strongly recommend our customers to give it very careful attention, because no matter how good the soil may be, if it is well fertilized, results will be both better and quicker.

The best general fertilizer for use on a newly built putting green is Carters Complete Grass Manure. This should be broadcast over the sur-

face of the green at the rate of one pound per three square yards.

#### THE SELECTION OF SEED

It is most important that a green should be sown with a mixture of grass seeds that is particularly suited to its geological structure, consequently we are always anxious to inspect the land personally, or at least to examine a sample of soil. When we have a knowledge of the soil, we specially prepare a prescription likely to thrive upon it. In cases where we have no knowledge of the soil, we send one of our standard prescriptions suitable for a medium soil.

We never add clover to these prescriptions unless specially ordered to do so. A small quantity of clover is not objectionable through the fairway, but we consider it a positive nuisance in a green, as it gives a patchy appearance to the turf. It is slippery, and becomes pulped under hard wear, it holds the dew longer than grass, it discolors the balls, and often diverts a truly hit ball.

All the finest growing grasses that are most suitable for the formation of a green are very shy seeders; that is, when grown for seed they naturally yield less weight per acre than do the coarser growing varieties; consequently the cheaper the mixture the coarser the turf. We also prepare and supply prescriptions consisting of fine and coarser growing grasses in proportion. But we maintain that the finest dwarf growing grasses are the most economical in the end, especially when used for sowing down large areas. The turf formed by the finest grasses requires to be mown only about half as many times as a turf formed by coarser growing grasses. This is a most important point, especially when one takes into account the large sums of money annually spent on mowing, and an independent investigation would undoubtedly prove that our method of sowing down land with the finest grasses gives the best results and is the most economical.

#### AMOUNT OF SEED TO SOW ON A PUTTING GREEN

In order to produce a close, dense turf of the finest description within a year from the date of sowing, given normal weather condition, the seed should be sown at the maximum rate of 4 ozs. per square yard to insure certain and early results.

It goes without saying that if the seed is sown thickly, the ground will be covered almost from the start with a thick mat composed of a multitude of little grass plants which, being mutually

protecting, will daily increase in strength, and in a few weeks form a close putting surface.

If, on the other hand, the seed is sown thinly, a thin crop is produced, which may be damaged or destroyed by a short burst of hot sun or cold wind, and in any case one has to wait for the young plants to grow and spread until they touch one another, mat, and so form a turf.

The cost of the seed is almost insignificant when compared with the cost of making a modern putting green, and when all is said and done a



**SOWING THE SEED**

Note the Clear Firm Surface and Guide Strings

heavy sowing is analogous to turfing, with the important exceptions that it is infinitely cheaper and, unless really first-class turf is procurable, infinitely better.

A bushel of Carters seed weighs 25 lbs., and the following tables gives the quantity required:

Size of Green	Quantity at 4 oz. Rate
20 × 20 yards	4 bushels
25 × 25 "	6 "
30 × 30 "	9 "
35 × 35 "	12 "
40 × 40 "	16 "

#### SEEDING

Sow the seed on the raked surface, choosing a calm, dry day for the work, otherwise much of the seed may be blown away and lost; or should the soil be wet it will stick to the operator's boots.

and in this way the level may be seriously disturbed. Divide up the ground into strips about 3 feet wide by means of pegs and string, and divide the seed into as many equal portions as there are strips or squares; this will be found an easy way to ensure an even distribution of the seed. Sow the seed by hand with the back bent, taking care to spread it as evenly as possible over the surface. The seed must now be covered to a depth not exceeding  $\frac{1}{4}$  of an inch, otherwise much of it will be lost. The most simple way to do this is to rake the surface lightly in two directions, taking care not to bury the seed too deeply. The ground should then be rolled and cross-rolled with a light roller.

#### AUTUMN SOWING

One of the best seasons to commence the operation of making a new green is as soon as possible after the break up of the hot summer weather, with the intention of sowing, if possible, at the end of August or during the early days of September. The soil is warm at the end of summer, and an abundance of rain and dew may be expected, which is very beneficial to the germination of the seed, and the young grass will have ample time to become well established before the real cold weather sets in. As weeds are far more in evidence in the spring than they are in the autumn, it follows that the long start given to the autumn-sown grass should make it better able to withstand the onslaughts of any weeds that may be lying dormant in the soil, when they appear in the spring.

#### SPRING SOWING

Prepare the ground as soon as the weather permits, and sow the seed (again weather permitting) early in April, or should it be a severe season sow during the early days of May.

It is always a good policy to allow as much time as possible in which to prepare the ground. A month or six weeks is not too much, as the surface will, to a certain extent, find its own level in that time, and any necessary corrections are more easily made before than after the seed is sown. When the work is done in a hurry it is generally badly done, in that no chance is given to the surface to consolidate. This consolidation of the surface is essential for the welfare of the young grass plants, since it allows the quick-growing weeds to assert themselves and be destroyed before the grass seeds are sown. A green made under our system, if autumn sown, that is, during the end of August or the beginning of September, should be fit for play by the end of

the following spring; if spring sown, that is, during April or early in May, it should be fit for play before the end of the summer. But these results cannot be obtained if old-fashioned parsimonious methods are adopted.

#### WEED SEEDS IN SOIL

Very frequently freshly dug land and imported soil will produce a strong crop of weeds, both annual and perennial. How the weed seeds get into the soil, and how long they will retain their germinating power, is a debatable matter into which it is not necessary for us to enter. The only way of making a good green upon foul ground is to allow it to lay fallow and clean it by frequently disturbing the surface with a hoe for a small plot, and a harrow for a large area.

#### WEEDS—CLEANING GROUND

This we will divide into two parts, cleaning freshly dug land and cleaning existing turf.

We always advise our customers to prepare the ground for a new green as long before the next seeding season as possible. This not only improves the soil and allows it to become consolidated naturally, but it gives an opportunity, which should not be lost, of freeing the land of the majority of the weeds that it may contain. As soon as the weeds appear, hoe them down, but do not hoe deeply enough to bring to the surface weed seeds which otherwise would be buried too deeply to grow.

#### AFTER TREATMENT OF A NEW GREEN

The young grass should appear above the ground in about five to ten days if autumn sown and fourteen to twenty-one days if spring sown, according to the weather. When about one inch high it is greatly benefited by a dressing of Rex Humus or prepared compost scattered over the ground. A mere dusting is sufficient in most cases. This top-dressing is very gentle in action, does not burn the young grass, but protects it from extremes of temperature and assists to conserve moisture. We cannot too strongly recommend the use of this top-dressing, as it supplies nitrogen in a very gentle manner to the young grass during the most critical period of its existence, and has an extraordinary effect on its growth. When the young grass is about one and one-half inch high it should be rolled with a light roller, and when about two inches high it is ready to be cut, with a freely running machine set rather high. It is most important to mow and roll the young grass regularly from the very start, otherwise it will

# Carters Seeds Still to the Fore



THE NEW PELHAM COUNTRY CLUB, PELHAM, N. Y. THE SIXTEENTH GREEN IN THE MAKING  
This course was sown exclusively with Carters Tested Grass Seed

PELHAM LEASING CORPORATION  
(Owner)  
PELHAM MANOR, N. Y.  
TELEPHONE 1034

January 3rd,  
1921.

Carters Tested Seeds, Inc.  
25 West 43rd Street, N.Y.

Gentlemen:-

Attention of Mr. Peterson.

The writer, in behalf of the Pelham Country Club, is desirous of expressing to you the extreme satisfaction and success had with Carters Tested Seeds, both for our Fairways and Putting Greens, when you consider that seed put into the ground on September 25th, brought forth strong and heavy turf within six weeks thereafter.

Notwithstanding, our new Course is blessed with exceptional soil, we feel so positive in the merit of the seeds you delivered to us, that we wish to compliment your product and wish lasting success to Carters Tested Seeds.

Believe me,

Very truly yours,

Chairman, Executive Committee,  
266 Madison Avenue, New York City.

Three months after seeding, the Chairman of the Executive Committee of the Pelham Country Club wrote this unsolicited testimonial.

*Carters Tested Seeds, New York, London, Toronto*

grow long and coarse, instead of tillering out and covering the ground. Any thin or bare places should be repaired as soon as noted, by very carefully loosening the surface soil, sowing a handful of seed, covering and rolling in the usual manner.

#### A WORD OF ADVICE

Putting greens should consist of a very fine dense and uniform turf. Weeds should not be permitted to exist in them.

Consequently, when making a green, do it

well; do not stint anything, either in quality or quantity, in labor, manure, or seed. When a green is in good condition keep it in good condition by continually freeing it from weeds; keep the turf up to the mark, by top-dressing it as frequently as possible, and constantly repair weak or bare places with sods taken from the turf nursery.

Should your greens show signs of deterioration, write to us; do not wait until they are quite spoilt. Our Service Department can help you—see page 3.

## 2. The Fairway

The building of the fairway consists briefly of five operations: (1) The removal of all obstructions, such as trees, rocks, stone walls, buildings, etc. (2) Ploughing and harrowing. (3) Drainage. (4) Preparing the seed bed. (5) Seeding.

After the ground has been thoroughly cleared of all obstructions, it should be plowed and harrowed, and all loose stones and other impediments removed. Where necessary, an efficient system of drainage should be installed. In some places it may be necessary to install a system of tile drains, while in others a system of grassy hollows will effectually take care of the surplus water.

#### MANURING

After the installation of proper drainage, the question of correct fertilization arises, and the question is a very broad one. For instance, ground that has been under timber differs materially from ground that has been under cultivation, and needs a different method of fertilizing; in the same way a heavy clay soil needs different treatment from that accorded to a light, sandy soil. However, it is generally found that land that is suitable for the building of a golf course is deficient in humus matter, and for this reason an application of manure or, better still, commercial humus, will be found very beneficial. See page 19. This should be well harrowed in, after which, the ground should be rolled with a fairly heavy roller, until it becomes firm and true.

#### THE USE OF LIME

In impoverished land, lacking in alkali, the use of lime is often found to be very beneficial. This sweetens the sour and acid soil, and increases the bacterial activity in the humus.

It should, however, be borne in mind that lime

and manure must never be brought into contact. The reason for this is that the moment manure and lime are mixed together, a chemical action takes place, whereby the nitrogen, which is the most valuable factor contained in the manure, is immediately converted into ammonia, in the form of a very volatile gas, which instantly escapes into the air and is lost. Therefore the application of limestone (pulverized and not hydrated) should be made as long as possible before that of the manure.

#### PREPARING THE SEED BED

After the ground has been carefully rolled, the entire fairway should now be fertilized with an application of Carters General Purpose Manure, using 700 pounds to the acre. This fertilizer is used in connection with seeding, to stimulate germination, and should be allowed to remain upon the ground for at least two days before seeding, to allow the fertilizer salts an opportunity to dissolve.

#### THE SELECTION OF SEED

As much care should be given to the selection of seed for the fairway as is given to the selection of seed for the greens. Carters Service Department is always ready to make a personal inspection of the ground, or to receive samples of soil, and to advise on the mixture best suited to the locality.

#### THE AMOUNT OF SEED TO SOW

The rate at which the fairway should be sown, should never be less than twelve bushels to the acre. Where quicker results are desired, sixteen bushels to the acre can be used to advantage.

These heavy sowings may seem to be extravagant and unnecessary—but are they? The capital invested in a golf club may be \$50,000



or more, and the cost of upkeep \$7,500 or \$15,000 per annum. Money, nowadays, is worth at least 8 per cent., it therefore follows that so long as a course is out of play there is a loss of interest on capital, upkeep, rent, loss of subscription, etc., which may easily amount to \$25,000 per annum or, say \$500 per week.

#### THE "APPROACHES"

The approaches to the greens, that is, the fairway immediately in front of the greens, should be given almost if not quite as much care as the greens themselves. Well kept approaches allow players to execute accurate running-up shots, and are also extremely useful as temporary greens in the spring and fall, when the regular greens are being top-dressed and seeded.

#### AFTER TREATMENT OF NEW FAIRWAYS

Great care should be taken not to allow the young grass to become too long; otherwise it will become coarse. It should be cut regularly.

Consequently, a golf course may cost a club anything up to \$500 per week while it is maturing, and if the period of maturity can be cut down by heavy sowing—and it can be cut down—a big saving is made in spite of the extra cost of the seed.

### 3. Tees

Tees are the most difficult part of a golf course to keep in good condition, as they are subject to much more hard wear per square yard than any other part of the course. Yet they are frequently neglected to a really terrible extent, with the result that in many cases they are little better than mud patches.

The best way to make tees if the soil is at all heavy is to lay them over a foundation of cinders, so as to ensure perfect drainage, and rather than one big tee make several smaller ones placed *en echelon* or step formation.

If this system is adopted the worn-out tee is automatically put out of the line of play when the tee plates are removed to a fresh one, thus enabling the former to be properly renovated with seeds, or re-turfed.

If large tees are used a certain amount of inconvenience is caused to the players during repairs. It is always a difficult matter to keep the players off the part under repair and much of the care and attention bestowed upon it by the greenkeeper is in vain.

Apart from this, tees placed in the above formation add to the interest of the course, as each

#### THE AMOUNT OF SEED TO SOW ON THE OUTSIDE OR ROUGH

One of the commonest mistakes made when sowing down a golf course is to sow the outside or rough with permanent pasture or other cheap seeds.

It is true that an initial saving of money can be made in this way, but those who have adopted the expedient have lived to regret it and regret it very bitterly.

In the first case, fast-growing grasses of this sort do not form a hazard, they are simply a nuisance—picture a hayfield to catch and hold every pulled or sliced shot—and the club faces a dilemma: it must either keep on cutting at heavy cost, or let the grass grow long and lose balls at heavy cost.

Our method is to sow the rough with exactly the same mixture of seeds as used on the course proper at the rate of six bushels per acre. In this way the rough is a real rough and a hazard formed of slow-growing grasses which only require to be cut half short by a reaping machine two or three times a year. Apart from this, should the lay-out of the course be altered at any time, the rough, with a little treatment, can be conditioned and brought into play.

tee, as it is brought into play, will slightly alter the character of the hole.

Old tees, if soft, muddy or wormy, can be improved to a very large extent if the worms are exterminated, and the tees given several heavy dressings of coarse breeze, charcoal, or sharp sand.

#### LEVELLING

A level tee can be made on a slope by removing the top spit, and levelling out the bottom with the subsoil and then spreading the top soil evenly over the whole area.

In cases where there is not sufficient top soil to enable this to be done, it is advisable to get out a rough level with the existing soil and cover the whole area with six or eight inches of soil, procured from elsewhere. The two most important points to remember when engaged in work of this class is to keep the best soil for the top and tread that used for making up until it is quite firm.

It is always advisable to allow made-up ground to stand for some time before finishing off with seed or turf, as it is pretty certain to settle in places.

# Two Fine Examples of Carter Turf

Produced Wholly From Carters Tested Grass Seed



Photo by Pietzcker

THE GREENS OF THE DETROIT COUNTRY CLUB ARE FAMOUS FOR THEIR QUALITY



Photo by Pietzcker

THE ELEVENTH GREEN OF THE COUNTRY CLUB, BROOKLINE, MASSACHUSETTS

The first example of permanent English turf produced from seed in the United States

*Carters Tested Seeds, New York, London, Toronto*

# Carters Service in South America

Where Our Experts Make Regular Visits of Supervision



THE PRESENT COURSE OF THE VALPARAISO GOLF CLUB AT VINA DEL MAR  
The course is built on the race course and is flat and featureless



THE SITE OF THE NEW VALPARAISO COURSE TO BE CONSTRUCTED BY CARTERS  
The stake shows the location for the first green in fine undulating country

*Carters Tested Seeds, New York. London, Toronto*

#### 4. Traps and Bunkers

Made bunkers may roughly be divided into two classes: pot or sunk bunkers, commonly known as traps, and bunkers built up above the ground level. To justify its existence a trap or bunker should be made to fulfil the following requirements:

(1) It should be sufficiently wide and deep to catch and retain a bad shot;

(2) It should be constructed in such a way as to give a player a possible chance to regain the fairway in one shot;

(3) The height of the bank and the depth of the trap should be governed by its width so as to guard against impossible lies if the trap is too narrow and deep, and, worse still, to guard against players playing out long shots, as they

frequently can if the trap is very wide and shallow, or guarded by only a low rampart;

(4) The bunkers ought to be made to look as natural as possible. This can only be done by taking every advantage of the lay of the land, and by avoiding symmetrical and artificial designs.

##### WHEN TO BUNKER A COURSE

Bunkers round a green should undoubtedly be built at the same time as the green, and should be so incorporated into the general contour of the green as to look as natural as possible. Moreover the cost of construction is very much less than when the building of bunkers is left until some later date. This is also true of bunkers on the fairway. A good architect knows where to place his bunkers and does not need to wait to see the hole played before starting to build them.

### PUTTING GREENS IN THE SOUTHERN STATES

Roughly, the United States can be divided into two climatic regions—North and South, so far as a perennial grass turf is concerned.

Generally speaking, the southern grasses are adapted to about the same region as that in which cotton is grown, but some thrive only where the winters are warm; i. e., from Florida along the Gulf Coast to Southern California.

Bermuda grass (*cynodon dactylon*) which consists of numerous varieties which vary particularly in their degree of coarseness and in the presence or absence of rootstocks, is relied upon principally in the South to form the basis for golf course turf. It will grow in all types of soil when well drained, although showing a preference for heavy clay loams.

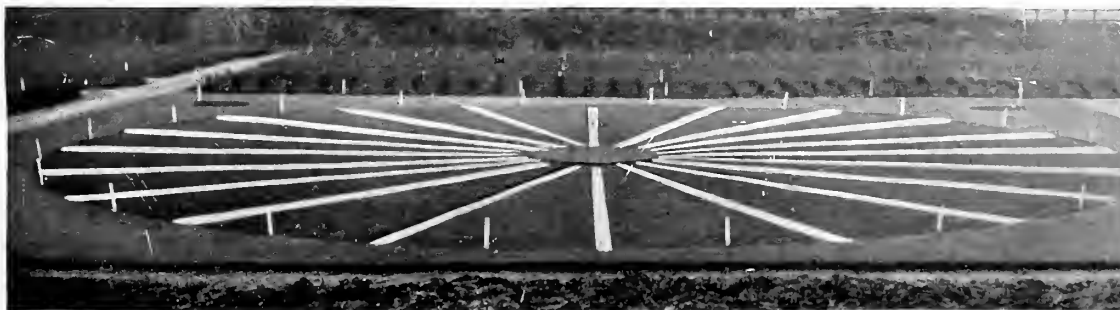
Bermuda may be grown either from seed or vegetatively from the turf. The propagating method of cutting the sod or rootstocks into small pieces with a feed-cutter and scattering them over loose soil and then rolling the surface firm,

is the most satisfactory, and produces the quickest results. The soil must be well prepared and manured, and often a liberal application of lime is advisable.

Other Southern turf-formers include Carpet-grass which is found along the Gulf in moist sandy soils, but which can hardly be considered a cultivated grass, the seed not being commercially available, although the sod can be propagated vegetatively. Then we find Japan Clover being used where the soil is poor, and Korean Lawn-grass or Palm Beach-grass.

These grasses, principally the Bermuda, form the natural turf in the South and thrive in the hot weather; while every Fall season Perennial Rye, Italian Rye, and Fancy Red Top seeds are sown and help produce a much finer growth for the Winter and Spring season's play.

They can only be considered as annuals, as the Summer weather in the South soon burns them up, or the Bermuda crowds them out.



THE CARTER WHEEL FOR TESTING GRASS SEED

*Carters Tested Seeds, New York, London, Toronto*

# Renovation and Upkeep

## THE RENOVATION OF A WORN OR POOR GREEN

The chief causes of a worn or poor turf are hard usage, poverty of soil, or want of proper drainage.

The result of hard usage is shown by the appearance of bare patches; the trade-mark of a poor soil is a thin turf and bare patches, with moss and an increasing number of weeds; while moss and stagnant water usually denote faulty drainage. Elsewhere we deal with weeds and drainage separately. We will now presume that the green is suffering from hard wear or poverty of soil. In both these cases the remedy is the same. Mow the green, cutting the grass as short as possible, dress the green with Carters Complete Grass Fertilizer at the rate of 2 ozs. per square yard, then rake and cross-rake the surface with an iron-toothed rake so as to work in the manure and thoroughly open up the surface soil. It is well to remember that the more the existing plant appears to be ruined, short of actually pulling it out by the roots, the better will be the results; and that unless the surface is loosened sufficiently, the roots of the young grass will not be able to penetrate the old turf, and consequently they will die, and the whole work prove a failure. Complete the work by sowing the seed on the raked surface. Choose a dry day, otherwise a quantity of the seed will stick to the wet leaves of the existing plant and so perish. If the raking has been carried out well, the surface will present a multitude of little furrows, which will receive the seed, and make excellent seed beds. Sow the seed thickly or thinly, according to the state of the turf. Cover the seed with prepared soil or compost (see page 19) either by scattering it with a shovel or by hand, and roll with a light roller.

## TO MAINTAIN A GREEN IN GOOD CONDITION

It is very simple to keep a green in good condition, although it entails a certain amount of expense and constant work. If a green is not kept up to the mark it is sure to deteriorate; the weeds will multiply, the soil become poverty stricken, and eventually have to be either re-sown or renovated.

A story runs that an American, admiring the really wonderful lawns at the Oxford University, and hoping to get some useful information, asked the gardener how it was done. The gar-

dener's reply was, that "they rolled 'em and mowed 'em, and rolled 'em and mowed 'em for 300 years." To this we should like to suggest that they top-dressed 'em and weeded 'em for the same period. Our experiments, although they have not extended over 300 years, have been in existence sufficiently long enough to prove fully that a green cannot be kept in first-class condition unless it is frequently top-dressed, particularly when the turf is much used. We advise our customers to top-dress their greens according to the system given on pages 35 and 36.

The rolling and moving part of the program should also be carried out, using a light roller and a good machine, which must be kept in good running order. Lastly, the weeds must be reduced or exterminated, otherwise they will increase; and it is impossible for a green to be termed good when infested with weeds.

## THE CONDITION OF GREENS AT THE END OF THE SUMMER

Many greens, quite irrespective of the class of soil upon which they stand, the fertility of the soil, or the quality of the turf, are often in an extremely precarious condition at the end of a long crowded summer season.

In many instances the greens, after a few weeks of the autumn rains and dews, recover; but the recovery is generally slow, and the greens, as a rule, are in anything but tip-top condition in the early autumn months, which, from the point of view of many golfers, are the most enjoyable of the whole year.

We have known instances of really first-class greens, situated upon good fertile golfing soil, that were so hard hit by drought and excessive wear during the summer months, that their constitutions became thoroughly undermined, and it took them years to throw off the ill effects.

All this was simply because they were not given a little help at the right moment and in the right way.

Greens in this condition after the summer season require special attention. It is of no use fertilizing them with slow-acting fertilizers. They require one that is highly soluble, and quick-acting, to stimulate the root action, and thus enable them to throw off the semi-comatose condition into which they have fallen.

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We therefore recommend that greens in this condition should be top-dressed with from 50 lbs. to 100 lbs. per 900 square yards of our Complete Grass Fertilizer, according to the condition of the green. It should be mixed with two or four barrow-loads of sifted soil for light soils, or of sharp sand for medium or heavy soils, immediately after the first autumn rains. Work the compost well into the turf, and so prevent any inconvenience to the players.

#### THE APPROXIMATE AMOUNT OF FERTILIZER REQUIRED

To get the best result from all fertilizers, the policy of a little and often, as opposed to one heavy dose, should be adopted.

Some of the most advanced greenkeepers use fertilizers right through the growing season, and, where water is laid on, even through periods of drought.

They examine the greens daily, and if one or part of one of them looks the least bit off color or tired, it is immediately given a light dusting of fertilizer mixed with finely-screened compost, followed, if necessary, by a second or third dressing at intervals of about a fortnight. This keeps it in good heart.

When dealing with undulating greens, the little mounds naturally burn before the valleys, and it is well to remember that if they are dressed without first perforating the turf with a hand perforating tamper, the fertilizer will wash off into the valleys, where it will bring on a proud growth but do little or no good to the areas requiring help.

The work, when done carefully, will not in any way interfere with the play of the greens.

Other greenkeepers with less imagination do nothing. They are either too busy with their mowing, or do not care to face the trouble of fertilizing, at what they consider the wrong time of the year. The result is that their greens gradually peter out during the summer, get thin, weedy, and develop bare patches.

There is no particular argument that we know of in favor of leaving greens to their own devices for months on end and giving them one big feed in the spring or autumn. As the system of "a little and often" only calls for a little extra trouble with nothing extra in the way of material, it has our strong recommendation.

The following table gives the approximate

amount of fertilizer required to dress greens of various sizes:

Size of Green.	Full rate of 2 ozs. per sq. yard.
20 × 20 ... ..	56 lbs.
25 × 25 ... ..	84 "
30 × 30 ... ..	1 cwt.
35 × 35 ... ..	1½ "
40 × 40 ... ..	1¾ "

#### MOWING

Cut the young grass for the first time when it is about 1½ to 2 in. high with a free running machine set high. It is most important to keep grass cut quite short from the very start, otherwise it will grow long and coarse, instead of tillering out and covering the ground.

Never allow the grass, whether it be young or old, to grow long and ragged. Two inches may be considered the extreme length to which it should attain at any time of the year. It is not advisable to keep grass too closely cut during hot and dry weather.

If a green be free from weeds, and is kept closely cut, the machine can be used without the box; the cut grass will not be very noticeable, and will afford the roots of the grass a certain amount of protection during hot and dry weather.

This must not be practised on weedy greens as the machine would cut off and scatter the weed seeds all over the green; whereas, were they collected in the box together with the cut grass, they would be removed and destroyed.

#### RESTING PUTTING GREENS

A putting green, once it is into good playing condition, i. e., free from worms and weeds, with a close turf of good quality and a true firm surface, needs no rest. It can be used continuously, except when frozen or covered with snow, provided it is regularly weeded, top-dressed, &c.

All the work necessary to keep good greens in good condition can be done while they are in play without causing any inconvenience to the players.

#### ROLLING

Turf will not thrive on a loose surface. After the grass has been cut for the first time, the whole surface must be carefully rolled with a light roller. This should be repeated after each cutting, until the turf is strong enough to bear a heavier implement.

Do not roll always in the same direction; roll from north to south one day, and from east to west the next, and so on. Do not roll when the

ground is hard and dry, as it will do no good, or during frosty weather, when it will do serious damage, but roll frequently during the spring and autumn. A wooden roller, made up in segments, will be found a useful tool for land that requires frequent rolling. The best metal rollers are made with two cylinders, to facilitate turning, and the outside edges are rounded, to prevent them from cutting the turf.

spring, especially after a severe winter, because frost has a tendency to lift the soil and turf. More damage is done to putting greens by over-rolling than by under-rolling.

An over-rolled or hidebound turf can be cured if treated as follows: Take a flat-pronged potato fork, thrust it into the turf to a depth of 5 or 8 in. and depress the handle so that the turf is lifted and loosened. Allow the turf to remain



Photo by Strohmeyer

A BEAUTIFUL ONE-SHOT HOLE AT THE PINE VALLEY GOLF CLUB

Greens that "kick" or play "untrue" can be easily made to play "true" by top-dressing the surface with finely sifted light soil and working the same into all the little holes and crannies by means of a birch broom or bush harrow.

It is much better for the turf to obtain a true surface in this way than it is to use a heavy roller and possibly make the surface hidebound. Grass will not thrive on a loose surface, nor will it thrive if the soil is packed too hard.

All grass lands should be rolled in the early

in this condition for a few weeks, then tread or lightly roll it down. "Springing" or lifting turf in this way should be done during the wettest period of the year.

#### DIVOT MARKS

One of the first things one learns about golf is the sentence "Please replace divots."

Many golfers replace divots, or see that their caddies do so, in a very conscientious manner, a greater number do it in a perfunctory manner.

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and a good number don't do it at all. When a divot is taken it is quite a matter of chance whether the scar heals quickly or remains open for a year or more.

It stands to reason that all divot marks heal quicker on rich soils than they do on poor sandy soils; also a divot taken when the soil is moist or during damp weather stands a fair chance for recovering quickly, whereas if it is taken during hot, dry weather it stands a very poor chance of recovering anyway until the next growing season.

The best way to heal divot marks is to fill them up with compost and seed in the following manner:

Three or four pounds of grass seed specially prepared to suit the soil of the links should be mixed with a barrow-full of dry sifted compost and a small quantity of Carters General Purpose Manure. A handful of this compost should be dropped into every divot mark, and pressed down with the foot.

It is astonishing how quickly and thoroughly all such scars "through the green" can be healed if the work is done systematically. The best way to do the work is to send out two men with one barrow-full of the compost; the barrow should be wheeled up the centre of the course and the men should work away from it one on either side, carrying a quantity of the compost in a bucket or other suitable vessel.

The best time to do the work is during March, April, May, September, and October.

#### WATERING GRASS

No matter what the nature of the soil, it is absolutely necessary to lay water on to all greens if the turf is to be kept in first-class condition.

**YOUNG TURF.**—Do not water young grass unless it is absolutely necessary, as the force of water, either from a hose or watering can, disturbs the soil, and damages the young and tender plants. If the seed is sown at the right time, that is, as soon as possible after the break up of the summer (say early September) or spring (say during April), it may not be found necessary to water it until it is amply strong enough to be able to withstand it, but one should always remember that drought is the worst enemy of young grass plants; a week of hot, dry weather will do ten times more harm than a month of frost.

**ESTABLISHED TURF.**—Use a hose, fitted with a fine spray. Distribute the water evenly over the green, giving it sufficient to go down to a depth of 6 in.

Water late in the afternoon, or, better still, in the evening. Do not water under a hot sun,

as it will quickly evaporate, and cause the soil to bake.

A green that has been regularly watered during the summer should be top-dressed in the autumn.

#### WET, MUDDY GREENS

The wet, muddy condition of greens during the autumn, winter, and spring is entirely due to the movements of millions of worms, which loosen the soil and throw to the surface tons of slimy, sticky mud. The words millions and tons may be considered by some to be exaggerative, but when we state that we have actually counted as many as 840 dead worms on one square yard of turf after using our Worm Killer, it follows that one acre of ground which contains 4,840 square yards, can easily carry between 4,000,000 and 5,000,000 worms; and if each worm casts  $\frac{1}{4}$  oz. of soil to the surface per annum, it is only natural that the surface is wet and dirty whilst they are at work from September to May.

If any attempt is made to make the green firm by rolling, the casts either stick to the roller and soil is actually taken away from the green, or else they roll down hard and smother out the fine grasses. If they are swept off with a broom, the green is not only impoverished by loss of soil, but the grass, being smeared over by the slimy mud, becomes unhealthy, and the action of the broom bruises the surface roots of the grass and exposes them to the air, with the result that many of the finest grasses die—and in both cases the green remains soft, dirty, wet, and cannot be used.

When the worms are exterminated a soft, sticky green becomes clean, firm, and comparatively dry, and as one of the constituents of the Carters Worm Eradicating Fertilizer is a valuable plant food, it immediately improves the growth and texture of the turf; and the green can be played on all the year round with equal enjoyment, when under the old conditions play would be uncomfortable, to say the least of it, for six months of the year, on account of the soft and muddy condition of the green, brought about by the worms moving the soil and throwing their slippery casts on the surfaces. (See page 31. Worm Eradicator.)

#### DIFFICULTIES ENCOUNTERED

No matter how carefully the soil is prepared and the seed selected, the result is largely in the hands of Nature.

If the weather is too cold and wet a quantity of the seed perishes, and the remainder struggles up in a weak, patchy condition.

On the other hand, if a drought sets in immediately the seed is sown or soon after, as so frequently happens in the spring, the germination of the seed is retarded or is killed before it shows up above the ground.

In both cases the finer or more delicate varieties are sure to be the first to perish, and the plant, instead of coming up thick and even, comes up in ragged patches, is often smothered with weeds and coarse grasses, and the character of the mixture is lost.

It has been proved that every yard of the earth's surface contains many thousands of weed seeds of one sort or another, and in some cases in the preparation of the ground weeds which do occur elsewhere on the estate are brought to the surface where conditions are conducive to germination. Luckily the majority are dead, and those that are not are smothered to a greater

or lesser degree by the close matting grasses, but in adverse seasons there is nothing to hinder their growth, and they thrive abundantly. When this occurs, the turf must be weeded and renovated or, in case of absolute failure, the existing plant must be destroyed and the ground re-sown.

In an extremely variable climate it is quite impossible to sow any crop with absolute certainty, even turf which is usually considered very safe frequently dries in whole or part when laid in the spring, and it always contains weeds of one sort or another, probably so small as to be hardly noticeable, but which develop the rankest growth when laid on well-prepared ground.

Consequently one must expect occasional failures, particularly from spring sowings, and when they do occur it is our settled policy to do all that we reasonably can to please our customers, in spite of the fact that we are not at fault.



Photo by Pietzcker

ON THE EAST COURSE OF THE MERION CRICKET CLUB, PHILADELPHIA

*Carters Tested Seeds, New York, London, Toronto*

# Soil Essentials

## The Use of Rex Humus

In order to produce vigorous, fully developed plant growth it is essential that a sufficient supply of plant food be available for absorption by the roots. This is a fact that has long been recognized, and the extensive study which has been given to the subject has resulted in the use of large quantities of chemicals designed to replace those used up during the period of growth.

It is equally important that careful attention be given to the other phase of the question, that of proper soil conditions. To support healthy plants, it is not enough that an abundance of food be provided, but it is even more necessary that the physical elements of the soil be present in proper proportions; in other words, the soil must be put in the best possible mechanical condition. The physical constituents of soil are, in general terms, first, *rock powder*, more or less changed by weathering; second, *sand*; third, *clay*, one of the chief results of the weathering of silicate minerals; and fourth, *humus*, the dark colored remnant of vegetable decay. According to the relative importance of one or the other of these elements, a soil is classed as heavy or light, sandy, loamy, or gravelly, etc.

### HUMUS

Most important of these elements is humus. Humus is the inky-black granular substance resulting from the decay of leaves, twigs, roots, grass, and other vegetable remains. Without humus, plants could not survive, and the productiveness of the soil is dependent on the amount of humus present.

### NECESSITY FOR HUMUS

Briefly stated, the chief reasons for the necessity of an adequate supply of humus in soil are:

First—It promotes the development of the crumbly, granular condition of the soil so necessary to plant health, and lessens the tendency to puddle and bake. A soil rich in humus responds more readily to tillage than one which is deficient in humus.

Second—Soil ventilation is improved by humus. This is particularly due to the open, granular tilth produced. The large pore space permits better circulation of air, and this favors deeper rooting and enables plants, particularly

grass, to better withstand the effects of the hot Summer sun.

Third—The capacity of the soil to hold water is increased by humus, due partly to the improved granulation of the soil and partly to the large amount of water which humus will absorb.

Fourth—The average temperature of the soil is increased owing to the dark color imparted by the humus, for the dark color increases the absorption of the rays of the sun. When there are dark streaks through a garden, provided they are well drained, the seed germinates and begins growth much more quickly than on a light colored soil. On a bright day the difference may be detected merely by the sense of touch.

Fifth—Humus promotes the conditions in the soil necessary for the development and multiplication of the important and very necessary nitrogen-gathering micro-organisms of the soil. Cultural conditions at the surface exert great influence on the character of these organisms and their number is closely connected with the amount of humus present.

### SOURCES OF HUMUS

The principal sources of humus in any soil are decaying roots, leaves, and other plant remains, green crops plowed under the surface, animal manures, and natural humus. A virgin soil usually contains a sufficient amount of humus to supply the needs of vegetable life, but, since the humus is used up by the growing plants faster than it is supplied by their decay, it is soon entirely exhausted unless some means is taken to replenish the stock. In order to do this, farmers frequently plow under the surface a green crop, such as cow-peas, rye or clover, finding this an inexpensive way of adding humus to their soil. This method, while excellent for farming purposes is, of course, out of the question on putting greens, lawns and gardens. As an alternative for green manuring of this kind, various kinds of animal manures are frequently utilized. These are unsanitary, have a most objectionable odor, and attract flies, and other vermin. They are unpleasant and dirty to use, and particularly on grass are most unsightly. In the case of lawns much of the good is lost owing to the necessity of raking off the material in the spring.





A PORTION OF OUR IMMENSE REX HUMUS BED AT WARBASSE, NEW JERSEY

The only way by which the failing supply of humus in the soil may be replenished, avoiding at the same time these disadvantages, is through the use of the pure, decayed vegetable humus known as REX HUMUS.

#### REX HUMUS

REX HUMUS is the pure and odorless product resulting from the gradual decay and disintegration of vegetable matter which has been accumulating for centuries. Although in a far more concentrated form, it is much the same as the black mould so noticeable in the woods. The deposit where REX HUMUS is found is located in a shallow depression covering hundreds of acres and

surrounded by a limestone watershed. This is one of the very few beds where nature has collected in one place a sufficient quantity of high quality humus to make it possible to obtain it in commercial quantities.

The deposit is of considerable depth and is composed of three well-defined strata. Of these, the thin top one alone, four to six inches in thickness, is black in color, completely decayed, sweet, odorless and granular. This is the material which forms the product we call REX HUMUS.

In the state in which this humus occurs in nature on the top of the deposit, it is not ready for shipment. In order to open it up, aerate



REX HUMUS IS SWEETENED BY YEARS OF CAREFUL CULTIVATION

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and thoroughly sweeten it, the beds are carefully drained and truck crops are grown for several years. During this period of cultivation, the root of the plants and the constant working of the humus incidental to the growth of the crops act to expose every grain of the material to the action of the sun and air. In a short time, all sogginess and excess of moisture is removed, and after several seasons of farming, the humus has become light and crumbly, aerated and sweet, and teeming with bacterial life. At each stage

the poor quality lower layer, which could not be avoided if we were to use machinery for this purpose. The material is then loaded into cars and transported over our industrial railway to the storage pile and sheds, where it awaits shipment.

It should be clearly understood that during its period of cultivation REX HUMUS is not subjected to any mechanical process or to operations other than the simplest of farming processes. It is not treated in any way, nothing is added, nothing



REX HUMUS PILED READY FOR SHIPMENT FROM THE PLANT

during our simple farming process samples are taken and subjected to the most severe and delicate chemical tests, especially those for acidity. The material is not passed as ready until these tests have shown that the humus fully measures up to our very high and rigidly maintained standard.

The beds are then cultivated after the crops have been removed in order to break up all lumps and to allow the remains of the roots, etc., to disintegrate. After this has been completed, the humus, when sun-dry, is gathered by hand, entirely precluding the possibility of taking any of

taken away. Our method is the only one which we know of in which all necessity for grinding, screening, etc., is absolutely eliminated. REX HUMUS comes to you in its natural state, pure, clean, *unadulterated* and efficient. The natural deposit is of exceptional quality, and this, together with our rigid maintenance of the high standard we have set, makes it entirely unnecessary to adulterate REX HUMUS with useless chemicals or to tamper with its natural excellence by any of the mechanical processes or other artificial cloaks which are so often used to temporarily disguise the deficiencies of poor natural products.

*Carters Tested Seeds, New York, London, Toronto*

# Composts

One of the most important factors in the upkeep of a golf course is the maintenance of compost piles, to supply top-dressing to the greens, fairways, approaches and tees. It must be remembered, however, that top-dressing required for a green differs from that required for other parts of the course, and for this reason two separate and distinct compost piles should be made. That for use on the greens should be composed of humus, sand, lime, and top-soil; that for use on the fairways, tees, etc., of manure, sand and top-soil. The latter should never be used on the greens.

It must be borne in mind that no hard and fast directions can be given for the building of a compost pile to suit all conditions of soil. The ingredients must be balanced to meet the requirements of particular types of soil, and the advice given here applies mainly to the formation of a compost suitable to a medium soil.

Select a convenient location for the building of the compost pile, and place the materials in layers 10" to 12" thick, in the following order:—

## Humus Compost for the Greens.

- (1). Top-soil.
- (2). One inch layer of pulverized limestone.
- (3). Sand.
- (4). Humus.
- (5). Finish with 1 inch layer of soil.

## Manure Compost for Fairways, etc.

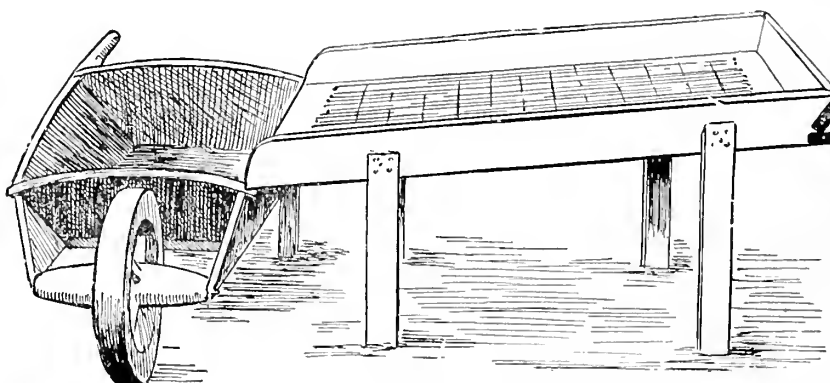
- (1). Top-soil.
- (2). Manure.
- (3). Sand.

NOTE: Lime should never under any circumstances be used in the making of a Manure Compost.

Both types of compost should be allowed to stand for a year before use, and it is therefore advisable, when making the original pile, to make it contain twice the quantity necessary for use the following year. As the pile becomes depleted, it should be renewed, and by this means, a constant supply of ready-to-use compost will always be on hand.

Perhaps the most economical method is to make two piles (of each type); when the first is finished, a third should be made, and the coarse stuff sifted from the first pile used for the foundation. When the second pile is used, a fourth should be made, thus keeping the supply constant. These piles should be broken down and turned over once or twice during the year. The piles should be broken down vertically in order to secure as even a distribution of the materials as possible. They should be passed by four men, two on each side, and restacked.

REX HUMUS is favored, particularly by the larger users, as an essential ingredient of compost piles. Every user of humus who can find space for a compost pile should have one, much expense being saved in this way. Within the limits of this booklet it is impossible to give more than the most general directions for the construction of a suitable compost pile, owing to the varying requirements of different classes of plants and soil conditions. In a general way, however, a compost pile will be made up as described above.



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# Some Well Known Courses

on which the finest turf was quickly produced from  
Carters Tested Grass Seed

National Golf Links  
The Country Club,  
Brookline  
Detroit G. C.  
Mayfield C. C.  
Engineers C. C.  
Sunset Hill C. C.  
St. Louis C. C.  
Country Club of  
Detroit  
Pine Valley C. C.  
Siwanoy C. C.  
Hollywood C. C.  
Old Elm C. C.  
Piping Rock C. C.  
Winchester C. C.  
Hillcrest C. C.  
Aronimink C. C.  
Worcester C. C.  
Country Club of  
Indianapolis  
Toronto G. C.  
Arcola C. C.  
Kanawaki C. C.  
Seaview C. C.  
Shuttle Meadow C. C.

## THE AMERICAN POTTERIES COMPANY

EAST LIVERPOOL, OHIO

January 7, 1920.

Carters Tested Seeds,  
25 W. 45th Street,  
New York City.

Gentlemen:

It is a great pleasure to write you a letter of appreciation of the work your Organization has done in the construction of our new Golf Course.

Not only have you fulfilled your contract in letter and in spirit but all of your representatives without exception, have shown a desire at all times to help us with the various problems, outside of construction, that continually arise in launching a new Country Club.

Our committee and our members are thoroughly satisfied with your work and if at any time our recommendation can be of the slightest assistance to you, please consider us yours to command.

Very truly yours,  
THE CONSTRUCTION COMMITTEE  
OF THE  
EAST LIVERPOOL COUNTRY CLUB

By *W. F. M. W. L.*  
Chairman

W-F

Indian Hill C. C.  
Salem C. C.  
Flint C. C.  
Sleepy Hollow C. C.  
Wannamoisett C. C.  
Tedesco C. C.  
Kernwood C. C.  
Utica C. C.  
Princeton G. C.  
Oak Park C. C.  
Somerville C. C.  
Brockton C. C.  
Rhode Island C. C.  
Spring Lake C. C.  
Willowick C. C.  
Westmoreland C. C.  
Glens Falls C. C.

### IN ENGLAND

Sunningdale  
Walton Heath  
Royal Wimbledon  
Sandy Lodge  
St. Georges Hill  
Coombe Hill  
Gleneagles



### A MODERN GREEN IN THE MAKING

At the Green Valley Country Club, Roxborough, Pa., one of the Carter Courses now under construction.

*Carters Tested Seeds, New York, London, Toronto*

## WHAT CARTERS SERVICE DEPARTMENT DID FOR T

The Open Championship of 1920 was assigned to the Inverness Country Club in January. In April, as soon as the frost was out of the ground, Carters Service Department was invited to put the course in first-class shape. The championship was played in August, and the excellent condition of the course



Courtesy of Golf Illustrated

DURING THE FINAL STAGES OF THE CHAMPIONSHIP. A PORTION OF T

Convincing proof of the success of the Carter System is contained in the subjoined communication from Mr. J. H. Bellows, Chairman of the Green Committee of the Inverness Country Club. If further proof were needed,

"I am greatly impressed with the fine condition of the Inverness course. The putting greens and fairways are practically perfect."

— TED RAY.

"The course is in fine condition and shows that great pains have been taken in its preparation for the championship."

— HARRY VARDON.

"The course is in magnificent shape and has drawn the keen approval of every candidate here."

GRANTLAND RICE,  
New York Tribune.

Carters Tested Seeds, Inc.,  
25 West 43rd St., New York, N

We thoroughly appreciate the  
tioning our course for the Nation  
lived up to your contract to the le

Chairman Green Co

*Carters Tested Seeds, N*



## THE INVERNESS COUNTRY CLUB IT CAN DO FOR YOU

was pronounced by the competitors to be a wonderful achievement. All materials used—Grass Seed, Fertilizers, and Rex Humus, were supplied by Carters and the conditioning of the course itself, including the newly constructed eighteenth green, was in charge of Carters Turf Experts.



Photo by Pietzcker.

### IMMENSE CROWD THAT SURROUNDED THE BEAUTIFUL EIGHTEENTH GREEN

it would be found in the unsolicited testimonials that appeared in the accounts of the championship. Of these we take pleasure in quoting a few by players and writers of world-wide reputation:

August 14, 1920.

service you have given us in conditioning the Open Championship. You have done it well and we are all very much pleased.

J. H. BELLOWES,  
Committee, Inverness Country Club.

York, London, Toronto

"I do not remember any links that were ever in as fine shape for a national championship as the Inverness course." JOHN G. ANDERSON,  
New York Sun-Herald.

"All the professionals are praising the Inverness course as they never praised a golf course at championship time before. The course is in fine shape and the club has groomed it to perfection."

WALTER HAGEN.



## WHAT CARTERS SERVICE DEPARTMENT DID FOR THE INVERNESS COUNTRY CLUB IT CAN DO FOR YOU

The Open Championship of 1920 was assigned to the Inverness Country Club in January. In April, as soon as the frost was out of the ground, Carters Service Department was invited to put the course in first-class shape. The championship was played in August, and the excellent condition of the course

was pronounced by the competitors to be a wonderful achievement. All materials used—Grass Seed, Fertilizers, and Rex Humus, were supplied by Carters and the conditioning of the course itself, including the newly constructed eighteenth green, was in charge of Carters Turf Experts.



Courtesy of Golf Illustrated

Photo by Pietzcker

DURING THE FINAL STAGES OF THE CHAMPIONSHIP. A PORTION OF THE IMMENSE CROWD THAT SURROUNDED THE BEAUTIFUL EIGHTEENTH GREEN

Convincing proof of the success of the Carter System is contained in the subjoined communication from Mr. J. H. Bellows, Chairman of the Green Committee of the Inverness Country Club. If further proof were needed,

it would be found in the unsolicited testimonials that appeared in the accounts of the championship. Of these we take pleasure in quoting a few by players and writers of world-wide reputation:

"I am greatly impressed with the fine condition of the Inverness course. The putting greens and fairways are practically perfect."

— TED RAY.

"The course is in fine condition and shows that great pains have been taken in its preparation for the championship."

— HARRY VARDON.

"The course is in magnificent shape and has drawn the keen approval of every candidate here."

GRANTLAND RICE,  
New York Tribune.

Carters Tested Seeds, Inc.,  
25 West 43rd St., New York, N. Y.

August 14, 1920.

We thoroughly appreciate the service you have given us in conditioning our course for the National Open Championship. You have lived up to your contract to the letter and we are all very much pleased.

J. H. BELLOWES,  
Chairman Green Committee, Inverness Country Club.

"I do not remember any links that were ever in as fine shape for a national championship as the Inverness course."

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WALTER HAGEN.

*Carters Tested Seeds, New York, London, Toronto*

# Weeds and Other Pests

## Some of the Uses of "Carterite"

### WEEDING YOUNG GRASS

Any annual weeds that may have escaped the hoeing will be extirpated by the mowing machine, so we can dismiss them from our minds. This leaves us the perennial weeds, which we will divide into three classes, as follows:—(1) Daisies and other fleshy shallow-rooted weeds, (2) Plantains and other weeds with roots not exceeding 4 in. in length, (3) Dandelions and other weeds with long tap-roots.

Young grass can be weeded without doing it any damage and without interfering with the level of the ground, if the following system is adopted:—

Procure a plank 9 to 12 in. wide, and as many feet long, and place it along the edge of the plot, and whilst standing on it pull out all the weeds in reach; when this is done, get off the plank and roll it over and proceed as before.

### THE DESTRUCTION OF DAISIES AND OTHER FLESHY SHALLOW-ROOTED WEEDS IN PUTTING GREENS

It is an accepted axiom with golfers that to putt on daisy-infested greens with confidence or accuracy is impossible.

This being so, how is it, we ask that so many greens remain subject to a defect of such large proportions, and that a serious attempt is so seldom made to free them from it?

The reason commonly given is this—that to effectually clear a green of daisies it is necessary to treat each plant separately, and ninety-nine people out of a hundred will tell you that this is impossible, that it would take years to do, that it would cost too much, &c.

We are now going to prove that not only is it possible to exterminate daisies within a reasonable time, but that it can be done at a comparatively small cost, having regard to the advantage derived from the treatment; though this consideration should always be borne in mind, that a good putting green, no less than a good lawn, is a product of time—of years, it may be—but that once made, it is an invaluable asset, and worth, therefore, all the expenditure of time, trouble, and money involved in making it.

### WHEN TO DO THE WORK

The work should be done during still, dry, bright weather, either in the autumn or in the spring.

### HOW TO DO THE WORK

- (1) Divide the green into strips, 2 ft. wide, by means of pegs and string.
- (2) Place the workers at intervals of, say, 5 yards apart, and instruct them to move in the same direction—from left to right. They are thus afforded ample room in which to work, without getting into each other's way.
- (3) Give each worker a distributor, which is a cylindrical tin, having a lid at the larger end—at which it is filled—the smaller end being cone-shaped, and having an opening  $\frac{5}{8}$  in. diameter.

Instruct the workers to proceed as follows:—

- (a) To place the first finger of the right hand over the opening and fill the tin with "Carterite."
- (b) To allow the "Carterite" to escape from the tin by removing the finger for such an interval as will allow to escape, say, a saltspoonful of the "Carterite" for a small plant, and larger in proportion.
- (4) Examine each strip before passing it as finished.

### THE COST OF DOING THE WORK

Work of this sort can probably be most economically done by piece; consequently, it is necessary to find out how long it takes on an average to do a strip, and then strike a bargain with the workers.

### AFTER TREATMENT

Allow the green to rest for about 14 days, so as to allow the "Carterite" to eat into the weed, then top-dress with finely-sifted light soil or sand, with which a little grass seed has been mixed. Work the top-dressing well into the turf with a broom in order that all the little hollows left by the dead weeds may be filled up.

### THE ACTION OF THE "CARTERITE"

"Carterite" does not poison the weeds or make the soil sterile; in reality it is a highly concentrated manure beneficial to grasses, but when applied in this manner burns the daisies and other shallow-rooted weeds to death.

When the "Carterite," through the action of the weather, loses its potency or burning power, it stimulates the surrounding turf to such an extent that the scar left by the dead weed quickly heals up, unless indeed the clump happens to be a large one, in which case it would be necessary to scrape or rake in a little grass seed.

### THE IMMEDIATE EFFECT UPON THE PUTTING SURFACE

Provided that the little holes and hollows left by the dead daisies are carefully filled by means of a compost as already described, little or no inconvenience will be caused to the players.

### TIME TAKEN FOR THE TURF TO HEAL

This depends very much upon the quality of the turf and soil. A thin turf upon a sandy soil will take from four to eight weeks; a vigorous turf on a heavy soil three to six weeks.

### THE PERMANENT EFFECT UPON THE GREEN

A green freed from daisies plays 100 per cent. better than it did before the treatment. A green consisting of grass only presents a uniform surface to the player, on which the most delicate shots can be brought off. On the other hand, how is it possible to gauge the strength, or even the direction, of a shot if the ball has to travel alternately over grass and daisy patches, the latter with their thick stiff leaves and cuppy crowns?

### IS IT WORTH IT?

This is a question for each committee to decide for itself; but we must point out that the welfare of a golf club depends to a large extent upon the excellence of the greens under its jurisdiction; and rightly so, as it is upon the greens that most matches are lost and won.

Although it may be expensive to get a weedy green into good condition, it is an easy matter to subsequently keep it in order, and thus enable the accurate putter to reap the full advantage of his skill.

A bad putting green puts all players on the same level, since it is just as easy for the inaccurate putter to fluke in as it is for the good player's ball to be diverted by the stiff leaves of a daisy; apart from which a bad green is bound to deteriorate and will eventually have to be remade.

It is also to be noted that a green treated in this way preserves its natural contour in respect of undulations, to which so much of the interest and science of putting pertain; whereas, if turfing is resorted to, a certain artificiality being inevitable, these desirable characteristics are apt to be lost.

### BROADCASTING "CARTERITE"

When a green contains so many daisies and other weeds of a similar nature that it is impossible to deal with them by hand, "Carterite" can be used with good effect if broadcasted over the surface at the rate of about 4 ozs. per square yard.

A green treated in the above manner will have to be put out of play for six or eight weeks or more until the turf heals.

We only recommend this system when there are so many weeds that it is impossible to deal with them by hand.

Like all other weeding operations, it should be carried out in a systematic manner, the green being divided up into strips by means of pegs and string, and the "Carterite" weighed out and applied carefully and evenly during bright dry weather.

The "Carterite," when applied in this manner, will also kill small plantains and other weeds.

### THE DESTRUCTION OF PLANTAINS AND OTHER WEEDS OF A SIMILAR NATURE WITH ROOTS NOT EXCEEDING 4 INCHES IN LENGTH

The system adopted for the destruction of these weeds is the same as that recommended for daisies, with the exception that the weeds are bodily removed instead of being killed in the ground.

Our reason for this is simple, although it would be an easy matter to kill the plantains in the turf, it must be remembered that they ripen their seeds early in the season and are remarkably prolific—consequently it would be idle to kill the weeds and leave the seed heads behind.

Although the system recommended varies but little to that recommended for daisies, we do not apologize for going into detail as we wish each section to be as self-contained as possible.

### WHEN TO DO THE WORK

Weeding of this class can be done at any time provided that the soil is damp, but the best months are undoubtedly April, May, September, and October.

### THE COST OF DOING THE WORK

There is no doubt that work of this class should always be done by piece work, otherwise it will go along very slowly, unless a good man is put in charge of the workers, and cost a lot of money. Consequently it is necessary to find out how long it takes on an average to do a strip and then to strike a bargain with the workers, or else to pay them so much per thousand weeds.

### THE WAY TO DO THE WORK

(1) Divide up the green into strips about 3 ft. wide.

(2) Place the workers at intervals of, say, 5 yards apart, and instruct them to move in the same direction—from left to right. They are thus afforded ample room in which to work, without getting into each other's way.

(3) Give each worker a 3-pronged daisy grubber.

(4) The workers should now take up their positions each at the end of a strip, spaced out as already described; if boys are employed, give them a box or low stool to sit upon; if women are employed, give them a sack or pad of some kind, as they generally prefer to kneel.

(5) Remove the weeds by forcing the fork into the soil about  $1\frac{1}{2}$  to 2 in. away from the weed and about the same depth. By depressing the handle of the tool, the soil will be forced up into a little mound, take the weed by the left hand, give it a slight shake, and out it comes.

(6) Examine each strip before passing it as finished.

(7) When the whole green is cleaned, top-dress it with finely sifted soil or sand with which a little grass seed has been mixed, using the seed in the proportion of 4 lb. of seed to 1 barrow-load of sifted soil; work the top-dressing well into the little holes left by the weed, by means of a soft broom or bush harrow.

(8) Roll and cross-roll with a light wooden roller.

### THE IMMEDIATE EFFECT UPON THE PUTTING SURFACE

Provided that the little holes and hollows left by the weeds are carefully filled by means of a compost as already described, little or no inconvenience will be caused to the players.

### TIME TAKEN FOR THE TURF TO HEAL

This depends to a certain extent upon the quality of the soil; a thin turf upon a sandy soil will take slightly longer than a vigorous turf on a heavier soil.

In either case the green will play truer seven days after treatment than it did immediately before the weeds were removed, and in three weeks time the turf will be quite healed and sound.

### THE AFTER EFFECT UPON THE SURFACE

A green freed from plantains and weeds of a similar nature will play 100 per cent. better than it did before treatment.

### THE VALUE OF WEEDING

This is a question for each committee to decide for itself, but we suggest that the system be given a trial on a portion of each green, in which the hole can be cut on competition days, as we are quite sure that, once the experience of putting on weedless greens is tested, ways and means will be found to clean the whole of all the greens.

### THE LASTING EFFECT OF THE SYSTEM

However carefully a green may be weeded a certain percentage of weeds in a young state are bound to be missed and the ground is sure to contain a number of weed seeds. Therefore, work of this sort should be continued for 2 or 3 years, so as absolutely to exterminate the pest. We must ask our readers not to be discouraged by this, because a bad green that took perhaps several days to clean in the first instance, will only take a few hours the second year; but if the survivors are left, they will multiply, and in a few years time the trouble will be as bad as ever.

### WEEDS WITH LONG TAP-ROOTS

The crown of the weed should be pierced with a sharp awl to the depth of an inch or more and a pinch of "Carterite" placed on the crown or top. If this work is done during bright dry weather at least 90 per cent. of the weeds will be killed, and it will be an easy matter to destroy the survivors by going over the turf a second time. This, like all other weeding, should be done every season in a systematic manner.

The large holes left by the weeds should be carefully filled up with sifted soil and a little grass seed mixed together and pressed down with the foot.

### CLOVER IN GREENS

Many beautiful greens are spoilt by the presence of a large percentage of clover plants. The little dwarf clovers usually found in mown turf are natives of this country and are generally most in evidence after a wet season or after the application of manures rich in phosphates or potash.



Clover in putting greens is very objectionable, because the foliage being soft, pulps under foot, stains shoes and balls, and becomes extremely slippery; it holds the dew longer than grass, and consequently keeps quite green during dry weather when the grass burns brown, and so gives the green a patchy appearance; its foliage being stiffer than the leaves of the grass makes the green slow, or worse still, slow in patches, and it dies away to a considerable extent in the winter.

The clover plants grow in two distinct formations; sometimes they are found forming self-contained patches, having apparently smothered out all the grass within their reach, and at other times they are found growing interwoven with the grass plants.

A clover plant or patch when in full foliage, in itself presents a very accurate surface, and a green composed entirely of clover when in full foliage plays "slow" but fairly accurately; in fact, more accurately than it would if only partly composed of clover; but in the winter when it loses its foliage little or nothing is left but its branches, which lie on the surface of the ground like so many pieces of stick and make accurate putting impossible.

If the clover is interwoven with the grass plants it is not so objectionable as when it grows in patches, but as there is always the danger of it growing more vigorously during a favorable season and forming self-contained patches, every effort should be made to eliminate it, or at least to keep it in check.

The eradication of clover is always a difficult matter, owing to the ramification of its roots, and any attempt to uproot it is doomed to failure and great damage will be done to the turf.

Clover belongs to the natural order of leguminosæ, and has the power in common with all leguminous plants of extracting nitrogen from the air and storing it in nodules attached to its roots.

Grasses, on the other hand, have no power to extract nitrogen from the air, and to flourish, grasses must have a plentiful supply of nitrogen; consequently it follows that if a manure rich in nitrogen is used on turf containing clover, it will help the grass without assisting the clover to an appreciable extent.

After a considerable amount of experiment we have been able to produce a manure with its ingredients so completely balanced, that it will, if used systematically, eventually starve out the clovers.

It is, of course, impossible for us to say how long this process takes, as its action to an extent

depends on the nature of the soil and the quantity of phosphoric acid and potash that is available, but if a green containing clover is dressed with our Anticlover Fertilizer, a distinct improvement in the grass and a diminution of the clover will be noticed within a few months of its application.

#### WITCH, CRAB OR SEPTEMBER GRASS

Witch, Crab, or September grass is an annual, tender, surface-rooting plant, the seeds of which are carried from place to place by the wind, but they cannot gain an entrance or grow in turf unless it is thin enough to allow them to reach the soil.

Now, as the plant is an annual, it will die in the fall of the year, and if it is not allowed to ripen its seed it cannot reproduce itself, and if the turf is kept sufficiently close to exclude the blown seeds, greens can be kept practically free from the weed.

In our opinion there are only two ways of dealing with this terrible pest—the first being to pluck the seedling plants out by hand as soon as they are large enough to handle (say, sometime about the middle or end of July), a laborious but efficient proposition, and then strengthen the turf so as to exclude blown seeds; the other—and we think, taking everything into consideration, the best—is to keep the turf as dense and close as possible with the double object of preventing the plants that are already in the turf from seeding and reproducing themselves and making it difficult for blown seeds to find a lodgment in the turf.

#### DADDY LONGLEGS OR CRANE FLY GRUBS IN TURF AND HOW TO DESTROY THEM

The Daddy Longlegs, or Crane Fly, lays its eggs in turf during the late summer or early autumn.

The eggs hatch out soon afterwards, and turn into what are commonly known as crane fly grubs or leather jackets.

As soon as the eggs are hatched the grubs start feeding on the roots of the grass, which turns brown in patches; these increase in size as time goes on.

Now is the time to detect the presence of the grub, assuming up to date that they have escaped notice, and to destroy the same.

A brown patch should be dug up to a depth of 6 in. and the soil carefully examined. Needless to say, the grubs when first hatched are very small indeed, but they eventually grow to a full inch in length.

### TO KILL THE GRUBS

Two lbs. of Paris green should be mixed into a paste with 1 lb. of fresh lime to which 400 gallons of water should be added.

The solution should be applied with a watering-can towards evening, when the grubs come close to the surface to feed. About 1 gallon per square yard should be used.

About 24 hours after the treatment the grubs will come to the surface in thousands; at this period the greens should be well bush-harrowed or brushed, so as to tear them out of the turf and generally assist in their destruction.

The solution is absolutely harmless so far as the green is concerned, and a few days after the treatment the green will begin to recover from the ravages of the grubs.

The Daddy Longlegs prefer a light sandy soil wherein to deposit their eggs, and we strongly recommend those interested in the upkeep of sandy links to keep a sharp look-out for the pest.

### CAUTION

Paris green, which can be obtained from any chemist, is a very potent poison; consequently, it should be used with great care, and no stock of any sort should be allowed to graze on the

treated greens within at least two weeks of the application.

### MOSS

This is a sure sign that the soil is out of condition, and is generally caused by poverty, or the want of proper drainage.

The moss can be eradicated and the soil conditioned by a dressing of Carters Shell Compost at the rate of  $\frac{1}{2}$  lb. per square yard.

If, however, the drainage is at fault or the moss has been allowed to get well established it will be necessary to follow our directions on drainage and renovating.

### MOLES

Though many experiments have been made with different methods of destroying moles, very few of them have proved as successful as could be desired, and the use of traps appears still to be the most efficacious. The ordinary camphor moth balls have been found useful in driving moles away, but they do not destroy the moles. Placed in the ground in the neighborhood of mole runs round greens and tees, they will keep the moles away as long as the camphor retains its strength.



Photo by Levick

THE "CAPE" HOLE, NATIONAL GOLF LINKS, SOUTHAMPTON, LONG ISLAND

*Carters Tested Seeds, New York, London, Toronto*

# Worms and Their Destruction

By the Use of Carters Worm Eradicating Fertilizer

By PETER W. LEES

To keep a putting green in good playing condition all the year round, the grass must be kept in as clean and healthy a condition as possible, and the surface must be firm and true.

It is practically impossible to achieve this result on greens infested with worms. The very action of the worms continually throwing casts keeps the surface soft, and the daily brushing and rolling which is required to make the green at all playable tends to destroy the finer grasses, and in the course of time they disappear and give place to coarse turfs and bare places.

We all know the discomforts of playing on "wormy" greens, and I think it is pretty generally recognized that the worms must be removed if good greens are required; and the question arises, how are we to get rid of the worms without injuring the grass?

There are several cures for removing worms from greens, and I think I have tried them all now, but at last I have got a really effective one in Carters Worm Eradicating Fertilizer. It is the simplest, safest, and most effective cure I have tried.

There is not the slightest danger of harming the turf, no matter how you use it; and that, I think (is a great point in its favor, as there are certain cures which are no doubt harmful to the worms, but at the same time damage the turf, which makes the cure worse than the disease; and, again, some are deadly poisons. Now if Carters directions are carefully carried out,

there is not the slightest fear but that it will do its work in a thorough manner. But it is most important to choose a mild, dull, muggy day, when the ground is wet, and to ascertain that the worms are working near the surface before using the powder, as it is no use trying to kill worms if they are deep in the ground; it would only be wasting time and money.

Apart from the improvement in the condition of the green, the question of labor also comes into consideration, as a green freed from worms does not require to be brushed and rolled daily, a distinct saving in labor, which will amount to anything between \$250.00 and \$500.00 per annum according to the size and number of the greens. I strongly recommend all green-keepers, especially inland ones, to give the eradicator a trial, as I am perfectly sure that it will do away with a lot of worry and many complaints; and, as things are at some clubs around London and other large towns, the players have good reason to grumble when they find the putting greens soft and black by reason of the worm casts, when they can so easily be made clean and firm.

The following interesting photographs were taken during the actual operation of cleaning a green:—

## DIRECTIONS FOR USE

(1) Leave the ground unrolled for several days so as to allow the worms to open up their runs.



WATERING IN THE WORM-KILLER



ONE-THIRD OF A "CATCH" FROM ONE GREEN

*Carters Tested Seeds, New York, London, Toronto*

(2) Select a mild day when the earth is moist and the worms are active.

(3) Cover the Lawn or Green with Carters Worm Killer at the rate of half a pound per square yard.

(4) Water the Worm Killer in immediately with a hose water eart, or can, and use as much water as possible.

The effect is instantaneous. The worms, large and small, struggle to the surface in thousands and die.

CARTERS WORM KILLER IS ABSOLUTELY INFALLIBLE, PROVIDED THAT IT COMES INTO CONTACT WITH THE WORMS.

If it does not touch the worms it cannot kill them; therefore use plenty of water.

Try one pound first before applying bulk. This will tell you if the worms are about.

Carters Worm Killer is a powder and is not poisonous to animal and bird life.

#### WHEN TO USE CARTERS WORM KILLER

The best time of the year to kill worms is during the breeding seasons, that is, roughly speaking, from the end of August to the beginning of December, and from the end of March to the end of May.

If water is laid on to a lawn or green, the Worm Killer should be applied during a spell of warm, dull, muggy weather, and watered in the usual manner.

If water is not laid on to the lawn or green, but a fair supply is available, greater care should be taken in choosing the time of application, that is to say, the Worm Killer should be applied *towards the evening* during a *continuous* spell of warm, moist, dull, muggy weather.

If no water is available, the Worm Killer should be applied during a settled spell of very wet weather, whilst it is actually raining hard.

#### THE AMOUNT TO USE

For a putting green about 20×20 yards	13¼ cwt
" " " 25×25 "	2¾ "
" " " 30×30 "	4 "
" " " 35×35 "	5½ "
" " " 40×40 "	7 "
For about a quarter of an acre . . .	5 "
" half an acre . . . . .	10 "
" three-quarters of an acre	15 "
" one acre . . . . .	1 ton

The advantages derived by using Carters Worm Killer:

- (1) The greens play true winter and summer alike.
- (2) The turf becomes clean and healthy.
- (3) The turf improves, as one of the constituents of the Worm Killer is a valuable plant food.
- (4) The surface becomes true and firm.
- (5) It is no longer necessary to roll or brush the greens every morning.
- (6) It is not necessary to rest the greens during the winter.
- (7) It reduces the cost of the upkeep of the greens.

Why worms spoil putting greens:

- (1) The worm casts make accurate putting impossible.
- (2) The continual movement of the worms makes the surface soft and spongy, which no amount of rolling will remedy.
- (3) Brushing off worm casts damages the turf, as the action of the broom bruises and exposes the surface roots of the grass.
- (4) Rolling down worm casts smothers the grass and is responsible for many bare patches.
- (5) The worm casts make a natural seed-bed for weeds.



THE QUALITY OF THE TURF HAS MADE BALTUSROL A FAVORITE CHAMPIONSHIP COURSE

*Carters Tested Seeds, New York, London, Toronto*

## Two Famous Carter Courses Abroad

Produced from Carters Seeds and famous for the quality of their turf



"HET GIRDLE," ONE OF THE BEST HOLES ON THE NEW KING'S COURSE, GLENEAGLES



SUNNINGDALE HAS LONG STOOD IN THE FOREFRONT OF ENGLAND'S INLAND COURSES

*Carters Tested Seeds, New York, London, Toronto*

# Chosen For Championships

Because of the Superfine Golfing Turf Produced From Carters Seeds



THERE IS NOT BETTER TURF IN THE WEST THAN AT THE DETROIT GOLF CLUB

Photo by Pietzcker



THE GREENS OF THE SIWANoy COUNTRY CLUB ARE CONSISTENTLY TRUE

Photo by Levick.

*Carters Tested Seeds. New York, London, Toronto*



# Fertilizing

## The Carter System of Top-Dressing

### LIGHT SANDY SOILS

Light, sandy soils are generally deficient in grass foods, humus, and moisture. The first two can be added, the third must be conserved. Organic manures, *i. e.*, stable or farmyard dung, add humus to the soil, and so conserve moisture and enrich the soil, but they cannot be relied upon alone to keep the soil fertile. Artificial manures, on the other hand, add no humus to the soil, but they add considerably to the fertility of the soil, provided that the soil contains sufficient body to hold them long enough for the roots of the grass to absorb them.

We, therefore, advise our readers to treat a light, sandy soil in the following manner:

The greens should be top-dressed twice in the Autumn and once in the Spring with a compost made up of equal proportions of humus and good light, loamy soil, or the soil of the course. One cartload of sifted compost is sufficient for an area of 150 square yards.

This will enrich the soil, add humus, and so conserve moisture, and fix the artificial fertilizers when applied.

The above should be supplemented every other year during March or April, with a dressing of 100 lbs. of our Complete Grass Fertilizer, which should be mixed with four or five times its own bulk of sifted sand or compost, in order to give a more even distribution of material and prevent any danger of burning the existing turf. This will make the deficiency of plant food between the amount taken out of the soil by mowing, etc., and the amount added by the dressings of compost. It will also give the grass a good start, and make it better able to withstand the trials of the coming season.

Both classes of compost should be well worked into the soil by means of a stiff broom or brush harrow. The quality of each dressing should vary in accordance with the capability of the turf for absorbing the same. Some turf can absorb or hide from sight much more than others can, consequently, it is impossible for us to give exact amounts. It should be borne in mind, however, that two thin dressings are better than one heavy one.

### THIN, POOR SOILS

This class of soil is also generally deficient in plant foods, humus, and moisture, and should be treated as follows:

The greens should be top-dressed twice in the Autumn and once in the Spring, with a compost made up of equal portions of good loamy soil, and humus, and approximately 100 lbs. of Hydrated lime supplemented every other year during March or April, with a dressing made up of 100 lbs. of our Complete Grass Fertilizer, mixed with four or five times its own bulk of sifted sand or compost, in order to give a more even distribution of material and prevent any danger of burning the existing turf.

### MEDIUM SOILS

Medium soils are frequently grossly mismanaged. They have the reputation of being rich and productive, and of carrying a magnificent turf. This reputation, though possibly well-earned in the past, has been their undoing.

It is often said, "Our greens do not require any manure; they are splendid, and manure would only make the grass soft and coarse." This plausible argument has spoilt more greens than any other, because it initiates a dangerous policy of "letting well alone."

All is not "well," for no matter how good a soil may be, its stock of grass foods is limited, and unless it is compensated for the amount taken out of the ground by the grass, it is sure to collapse sooner or later.

The greens built in medium soils should be top-dressed once in the Autumn and once in the Spring, with a compost consisting of two parts of own soil, two parts of humus, and one part good sharp sand, supplemented every third or fourth year during March or April, with a dressing of 100 lbs. of our Complete Grass Fertilizer, mixed with four or five times its own bulk of sifted sand or compost in order to give a more even distribution of material and prevent any danger of burning the existing turf. If the surface of the green is inclined to be soft, it should be top-dressed during the Autumn with sea-sand at the rate of four tons per green, the sand should be well-rubbed into the surface with the back of

an iron rake. This treatment, which may take the place of one of the Autumn top-dressings should be repeated for two or three years if necessary, but the amount of sand should be reduced after the first dressing to two tons.

#### STIFF SOILS

The remarks applied to medium soils also apply to stiff soils.

The greens should be top-dressed once in the Autumn and once in the Spring with a compost consisting of equal proportions of good light soil, humus, and sharp sand, supplemented every third year during March or April with a dressing of 100 lbs. of our Complete Grass Fertilizer. This should be mixed with four or five times its own bulk of sifted sand or compost in order to give a more even distribution of material and prevent any danger of burning the existing turf.

Stiff soils, apart from manuring, should be specially treated so as to produce a nice, firm, porous surface. We, therefore, recommend that they should be given this additional treatment:

During September, October or November, if the weather is open and the surface soft, the green should be covered with from four to six hundred lbs. of charcoal, according to the state of the green. The charcoal should be well-rubbed into the soil with the back of an iron rake, then lightly roll. A final top-dressing of four tons of sea-sand should then be applied to each green in the same manner.

It may be necessary to repeat the treatment, if so, the dose should be reduced by about one-half. It must, however, be remembered that both charcoal and sand are practically valueless as manures.

#### CLAY SOILS

These are perhaps the most difficult class of soils to deal with, and one must always bear in mind that before any marked improvement can be made, the mechanical condition of the soil must be improved. The soil must be made more fertile, porous and warmer.

Each green should be top-dressed once in the Autumn and once in the Spring with a compost consisting of equal portions of good light soil, humus, and sand, supplemented every other year with a Spring dressing of 100 lbs. of Carters Complete Grass Fertilizer, mixed with a load of sharp sand. During September, October or November, the greens should be top-dressed with charcoal at the rate of from 4 to 6 cwt. per green. The charcoal should be rubbed in with the back of an iron rake and lightly rolled, after which a final top-dressing of sand should be

applied in the same manner, at the rate of about 4 tons per green.

#### PEATY SOILS

If the soil is wet or sour, it must be drained and given a good liming. It should be top-dressed once in the Autumn and once in the Spring with a compost consisting of two parts good light soil, two parts humus, and one part sand. This should be supplemented with an Autumn dressing of charcoal at the rate of from 4 to 6 cwt. per green. Every other year a Spring dressing of 100 lbs. of Carters Complete Grass Fertilizer, mixed with half a load of sand, should be given to each green.

#### SAND AND CHARCOAL

Putting greens standing on heavy, wet, and other soft soils can be improved to an enormous extent if they are given a dressing of prepared charcoal.

Charcoal must not be regarded as a manure, but as a purifying absorbent which tends to aerate, purify, and sweeten the soil, firm up the surface, and fine down the turf.

The charcoal should be applied broadcast at the rate of from 56 to 84 lbs. per 100 square yards, during the wettest period of the year, when the soil is in its softest condition and best able to absorb it. It should be well rubbed into the turf with the back of a wooden rake and then lightly rolled.

One cubic yard of sand will cover an area of 144 superficial yards to a depth of a  $\frac{1}{4}$  in., or 288 yards to a depth of  $\frac{1}{8}$  in.

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PRICES AND SAMPLE OF CARTERS SPECIALLY PREPARED  $\frac{1}{4}$ -IN. DUST DRY CHARCOAL ON APPLICATION.

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Sharp sand (sea sand preferred) is another very excellent dressing for soft, heavy, or spongy greens, especially if used in conjunction with charcoal.

\* \* \* \* \*

NOTE.—All the quantities named in the above system of top-dressing are based on a green of approximately 900 square yards, unless otherwise stated. Moreover, it has been presumed that the worms have been eradicated. If not, it will be useless to try to produce a firm, true putting surface by the employment of charcoal and sand, since the worms will quickly neutralize their effect.

We are certain that if our system is given a fair trial, it will prove successful.

*Carters Tested Seeds, New York, London, Toronto*

# Turf

The only point in favor of turf is that it looks well immediately it is laid, in fact it often looks better then than it ever does afterwards.

Turf must be laid during the autumn to get the best results; even then it is the most expensive and unsatisfactory mode of making a green, as it generally contains coarse grass and many weeds.

## TURFING

The ground should be dug to the depth of a spade or more, and any necessary alterations made in the level. It should be covered with a liberal dressing of well rotted manure, at the rate of one load to every hundred square yards of ground. The manure should be worked into the soil so that it becomes incorporated with the surface soil, and should not be buried too deep. The surface should be broken into as fine a tilth as possible and cleared of all large clods, stones, weed roots, etc. It should then be rolled and cross-rolled with a light roller. Any defects that may have developed in the level should be corrected. The surface should then be lightly opened with an iron rake and bed watered lightly. The turf should then be laid upon the raked surface and beaten down with a turf-beater and watered thoroughly. Care should be taken not to beat the turf down too severely.

The turf should now be covered with a compost made up of finely sifted soil with which a few pounds of grass seed have been mixed. The compost should be well worked into the turf with a new birch broom or bush harrow. The surplus compost should then be removed and the turf rolled with a light roller. The turf should be allowed to remain in this condition for about six weeks after which it should be mowed and rolled regularly.

The correct thickness to cut turf is about 1½ in. if rolled, and 2 in., which must be considered the maximum, if flat, otherwise it will take a long time to knit. The correct time to turf is between September and December; turf can also

be laid during February and March, if the weather is open, but it is more risky than autumn turfing, because a spell of cold dry winds, such as we often experience in the late spring, will cause the turf to curl up and die. All turf should be carefully weeded before it is laid.

## HOW TO CUT AND TRIM TURF

The turf should be marked out to the desired width with pegs and string and then cut with a racing iron or edging knife. The strings should then be removed and placed at right angles to the cut so as to mark the length of the turfs, which can then be cut and lifted in the ordinary manner.

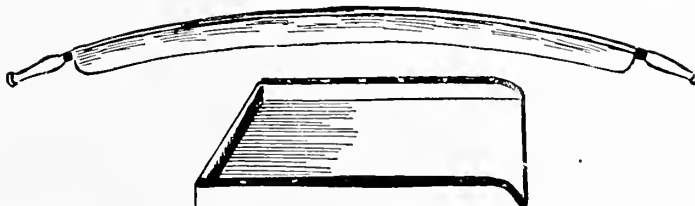
Rolled turf should be cut about three feet long, one foot broad, and about one-and-one-half inches thick, and flat turf twelve inches square by two-and-a-half to three inches thick, and then trimmed down to two inches in the following manner:

A three-sided gauge box should be procured, twelve inches wide, sixteen inches long, and two inches deep, with the top edges bound with metal, and the fourth side left free so that the turf can be slid in and out of it easily. The turf should be placed in the box, grass side down, and a turf knife run along the top side of the box from the free side. In this manner turf can be cut to any desired thickness with mathematical precision.

## TURF NURSERIES

All go-ahead clubs should have a turf nursery, which is made and used as follows:

Two plots of ground should be prepared, sown, and kept in exactly the same way as the greens are kept. They will make two pieces of excellent turf, which will be found very useful during autumn or spring for repairing bare or weak places in the greens. When one plot is cleared, it should be leveled up and sown again, and use made of the second plot. In this way a continuous supply is available at very little cost during all the seasons.



*Carters Tested Seeds, New York, London, Toronto*

## A FEW FACTS

The twelve primary constituents found in plants—

Nitrogen, Potash, Phosphoric acid, Lime, Water (hydrogen and oxygen), Carbon, Iron oxide, Magnesia, Sulphuric acid, Silica, Soda, Chlorine.

Nitrogen, phosphoric acid, lime, and potash are the chief constituents to fail, because they are used up at a greater rate than any of the others.

Soil without nitrogen is barren.

Nitrogenous manures tend to encourage grasses.

Phosphatic manures tend to encourage clovers.

Sandy soils are generally deficient in humus.

Artificial manures add no humus to the soil.

Organic or farmyard manures add humus to the soil.

Humus is decayed vegetable matter.

Humus retains moisture, and gives body to a sandy soil.

Humus warms a cold clay soil, and makes it work easier.

Humus is a necessity in all soils.

Potent artificial manures are apt to destroy humus in light soil.

Farmyard manure made in a pit is half as valuable again as manure made in the open.

Farmyard manure stored in the open should be covered with two or three inches of soil.

Soil fixes and retains ammonia.

The value of farmyard manure depends largely upon the quantity of nitrogen it contains.

Farmyard manure, if placed in uncovered heaps, loses a large percentage of ammonia by volatilisation.

Peat moss manure is more valuable than straw manures, especially for light sandy soils: it is richer in nitrogen, and conserves the moisture.

Farmyard manure, if relied upon alone, is reputed to exhaust the soil.

Farmyard manure warms the land.

Farmyard manure retains the moisture and ammonia in light soils.

Farmyard manure renders stiff soils more friable.

Root absorption only takes place when the plant foods are in the liquid or gaseous form.

Insoluble manures should be used in the autumn, so that they become weathered, and partly

or wholly soluble by the following spring, when the plants can absorb them.

Soluble manures should be applied when the plant is growing and able to absorb them.

Soluble manures applied when the plant is dormant will be lost and do no good.

All manures and composts should be used in a very finely sifted state, and worked into the turf by means of a stiff broom or bush harrow, so as not to interfere with the play of the greens.

Several light dressings of manure or compost do more good than one heavy dressing, and the play of the green is not interfered with.

Use good light loamy soils for top-dressing.

Lime sweetens sour lands.

Lime decomposes organic matter, and hastens the process of nitrification.

Nitrification is the change brought about by fermentation or bacteria.

Lime liberates soluble potash from insoluble compounds present in the soil.

Lime improves the physical nature of the soil.

Lime renders clay lands more friable, and converts insoluble compounds into soluble ones.

Lime makes sandy soils less porous, and helps to retain moisture.

Lime is one of twelve primary constituents of plant life.

Lime is necessary for the growth of grasses.

Lime in excess tends to encourage clovers.

Dwarf growing clovers and trefoil are valuable "through the green" on hot dry soils; they bind the sand, make a good bottom, and, because they store nitrogen, help the grass.

Clovers are undesirable on putting greens, so take care that you do not manure the greens with manures containing phosphates in excess.

A green apparently without clovers will often produce a large crop of clovers when manured with manures containing phosphates in excess.

Highly soluble manures should not be used on sandy soil, because they will dissolve with the first rain and be washed out of reach of the roots of the grass and so wasted.

No artificial manures should be used during very wet weather for the same reason.

No artificial manures should be used during hot dry weather, because they lie about on the surface and waste.

All artificial manures should be used during dull, damp weather.

Artificial manures do not act equally upon all soils.

Artificial manures usually give better results on heavy soils than on light soils.

Artificial manures should not be relied upon alone, especially on light soils.

Manures may be divided roughly into three classes—

- Organic or natural manures;
- Artificial or manufactured manures;
- Special, or manures made up to encourage certain crops.

Organic manures—Blood Manures, Brewers' Grains, Bran, Composts, Farmyard Manure, Fish Refuse, Hides, Horn, Hair, Human Excrements, Oil Cake, Poudrette or Native Guano, Sewage, Seaweeds, Sheep Fold Manure, Urine or Liquid Manure, Woollen Refuse or Shoddy, etc.

Artificial manures—Ammonium Sulphate and Ammoniacal Liquor, Bones of all sorts, Basic Slag, Coprolites, Dissolved Wool, Dissolved Peruvian Guano, Guanos, Gypsum, Kainit, Lime, Mineral Phosphates, Nitrate of Soda, Nitrate and Muriate of Potash, Norwegian Fish Guano, Retrograde and Precipitate Phosphate, Rodunda Phosphate, Spent Iron Oxide, Salt, Sodium Salts, Sulphate of Iron, Sulphate of Magnesia, Silica, Vegetable Ashes, etc.

We will deal with some of these exhaustively, others we will ignore, either because they are of little value or difficult to obtain.

Soluble manures are those that dissolve quickly.

Insoluble manures are those that take a long time to dissolve, decompose, or become disintegrated.

Most artificial manures vary as regards their solubility.

A soluble manure is quick in action.

A partially soluble manure is not so quick in action.

Insoluble manures are slow in action.

The value of an artificial manure is determined by the standard of its purity and by the balance or relative proportion of its component parts.

Gas lime contains sulphate and sulphide of lime, which latter is poisonous to plant life unless the gas lime is exposed to the weather for a long period.

Gas lime is of less value than either carbonate of lime or quicklime.

Gas lime is chiefly used for cleaning verminous land.

Lime is present in most soils in sufficient quantity to sustain plant life.

Gravelly, granitic, and peaty soils are generally deficient in lime.

Snow cannot be classed as a manure, but it has a very beneficial effect upon turf, as it protects it from the extreme cold and keeps it comparatively warm.

Never sweep snow from greens and never play upon frozen greens.

#### NEVER MIX

- Dung with lime.
- Guano with lime.
- Guano with slag.
- Nitrate with superphosphate.
- Sulphate with slag.
- Superphosphate with slag.
- Lime with sulphate of ammonia.

#### THE FOLLOWING MAY BE MIXED—

- Superphosphate with sulphate of ammonia.
- Bones with nitrate of soda.
- Bones with sulphate of ammonia.
- Bones with slag.
- Slag with nitrate of soda.
- Fish guano with any manure.
- Phosphatic guanos with nitrate of soda.
- Phosphatic guanos with sulphate of ammonia.
- Organic manures with any mineral manures.

# A Fine Example of Modern Construction



THE SEVENTEENTH GREEN OF THE LAKEVIEW COUNTRY CLUB IN THE MAKING

One of the many courses constructed by Carters on the Carter system, which have given unqualified satisfaction  
—as shown by the following unsolicited testimonial.



Wednesday, January 5th.  
1921

Messrs Carters Tested Seeds, Inc.  
133, East King Street,  
Toronto, Ontario.

Gentlemen:-

"We are taking the opportunity at this time to express our appreciation of the highly satisfactory results obtained by your Company in the construction of our new course. Visitors, as well as the members of our Club, have not hesitated to offer their praise and we think it will do much towards the better development of Golf in Canada."

Yours very truly,  
The Lakeview Golf & Country Club, Ltd.

*Fredrick C. Munro*

General Manager.

*Carters Tested Seeds, New York, London, Toronto*



## Alphabetical List of Clubs where Carters Tested Grass Seed, Fertilizers and Worm Eradicator are used.

- |   |                                      |                                   |
|---|--------------------------------------|-----------------------------------|
| Abenauqui Golf Club                     | Buffalo Country Club                 | Dover Bay Country Club            |
| Adelphia Country Club                   | Burlington Country Club              | Dunwoodie Country Club            |
| Aladdin Country Club                    | Burlington Golf Course               | Dutchess Golf & Country Club      |
| Albany Country Club                     | Butler Country Club                  | Duxbury Golf Club                 |
| Albemarle Golf Club                     | Calumet Country Club                 | Duxbury Yacht Club                |
| Algonquin Golf Club                     | Camp Wyonna Golf Club                | Easton Country Club               |
| Alliance Golf Club                      | Canton Country Club                  | Edgewater Golf Club               |
| Alpine Golf Club                        | Castine Golf Club                    | Edgewood Country Club             |
| Am. League Base Ball Grounds            | Cedar Rapids Country Club            | Edgewood Golf Club                |
| Annandale Golf Club                     | Century Country Club                 | Eldorado Country Club             |
| Ann Arbor Golf Club                     | Chagrin Valley Hunt Club             | Elizabethtown Country Club        |
| Antlers Country Club                    | Champaign Country Club               | Elkridge Hunt Club                |
| Apawamis Club                           | Charlevoix Golf Course               | Ellwood Country Club              |
| Arcola Country Club                     | Chatham Bar Inn Golf Club            | Elmhurst Golf Club                |
| Ardley Club                             | Chenequa Country Club                | Elmira Country Club               |
| Arlington Country Club                  | Cherry Valley Country Club           | Engineers Country Club            |
| Aronimink Country Club                  | Chestnut Hill Golf Club              | Erie Golf Club                    |
| Arundel Golf Club                       | Chevy Chase Club                     | Essex County Club                 |
| Asheville Country Club                  | Chicago Heights Country Club         | Essex Co. Golf Club               |
| Association Island Golf Club            | Chicago Golf Club                    | Essex Co. Park Golf Course        |
| Atlantic City Country Club              | C. I. Corby Estate Golf Course       | Estate P. D. Beckwith Golf Course |
| Atlantic City Park Dept.                | Cincinnati Golf Club                 | Euclid Club                       |
| Audubon Country Club                    | City of Boston                       | Evanston, Ill., Golf Club         |
| Augusta Country Club                    | City of Newark Park Department       | Evanston Mo., Golf Club           |
| Aurora Country Club                     | City of St. Louis                    | Everett Golf and Country Club     |
| Ausable Club                            | Claremont Golf Club                  | Excelsior Springs Country Club    |
| Automobile Country Club                 | Clifton Springs Sanitarium Golf Club | Exeter Academy Golf Club          |
| Aviation Club                           | Clinton Country Club                 | Exmoor Country Club               |
| Bala Golf Club                          | Coles Country Club                   | Fairlawn Heights Golf Club        |
| Baltimore Country Club                  | Colonia Country Club                 | Fairmont Country Club             |
| Baltusrol Golf Club                     | Colorado Golf Club                   | Fairview Country Club             |
| Barton Hills Country Club               | Columbia Country Club                | Fall River Golf Club              |
| Bass River Golf Club                    | Columbus Country Club                | Findlay Country Club              |
| Bass Rocks Golf Club                    | Commonwealth Country Club            | Flint Country Club                |
| Bay City Country Club                   | Concord Country Club                 | Flossmoor Country Club            |
| Beach Club                              | Congress Lake Club Co.               | Flushing Country Club             |
| Beaconsfield Golf Club                  | Cortland Golf Club                   | Forest Hills Field Club           |
| Bear Hill Golf Club                     | Country Club of Atlantic City        | Forest Park Country Club          |
| Bedford Golf and Tennis Club            | Country Club of Buffalo              | Fort Dodge Country Club           |
| Bedford Hills Golf Club                 | Country Club of New Canaan           | Fort Schuyler Club                |
| Bedford Springs Hotel Co.               | Country Club of Peoria               | Fort Wayne Country Club           |
| Belleclaire Golf Club                   | Country Club of Pittsfield           | Fox Hills Golf Club               |
| Bellerive Country Club                  | Country Club of Waterbury            | Framingham Country Club           |
| Bellevue Country Club                   | Country Club of Beloit               | Frankford Country Club            |
| Bellevue Golf Club                      | Country Club of Indianapolis         | Franklin Country Club             |
| Bellingham Golf & Country Club          | Country Club of Lakewood             | Franklin Park Golf Course         |
| Bellport Golf Club                      | Country Club of Lexington            | Galen Hall Co.                    |
| Belmont Spring Country Club             | Country Club of Rochester            | Garden City Country Club          |
| Berkshire Country Club                  | Cranford Golf Club                   | Garden City Golf Club             |
| Beverly Country Club                    | Crawford House Golf Club             | Geneva Country Club               |
| Binghamton Country Club                 | Crescent Athletic Club               | Geneva Golf Club                  |
| Blind Brook Country Club                | Crow Point Golf Club                 | Glen Echo Country Club            |
| Bluefield Country Club                  | Curtis, Cyrus (Golf Course)          | Glen Ridge Country Club           |
| Bluff Point Improvement Co. Golf Course | Danville Country Club                | Glen Falls Country Club           |
| Bogy Investment Co. Golf Club           | Dayton Country Club                  | Glen Oak Country Club             |
| Boise Country Club                      | Deal Golf Club                       | Glen View Club                    |
| Brackenridge, H. M. (Golf Course)       | Decatur Country Club                 | Grassy Sprain Country Club        |
| Brae-Burn Country Club                  | Dedham Country Club                  | Greenfield Country Club           |
| Brampton Golf Club                      | Deer Park Country Club               | Greensburg Country Club           |
| Brattleboro Country Club                | Denver Country Club                  | Green Spring Valley Hunt Club     |
| Bridgehampton Golf Club                 | Denver Park Dept.                    | Green Valley Country Club         |
| Broadmoor Club                          | Detroit Country Club                 | Greenville Country Club           |
| Brockton Country Club                   | Detroit Golf Club                    | Greenwich Country Club            |
| Brookline Country Club                  | Detroit Masonic Country Club         | Griswold Golf Course              |
| Brunswick Golf Club                     | Dixville Notch Golf Club             | Gulph Mills Golf Club             |
|   | Dodge, J. F. Estate Golf Course      |                                   |
|   | Dorsett Field Club, Inc.             |                                   |

(Continued on page 42)

*Carters Tested Seeds. New York, London, Toronto*

## Alphabetical List of Clubs where Carters Tested Grass Seed, Fertilizers and Worm Eradicator are used.

(Continued from page 41)

Guyan Country Club	La Fayette Country Club	Mohawk Golf Club
Hackensack Golf Club	Lake Geneva Country Club	Moline Golf Club
Hamilton Golf and Country Club	Lake George Club	Monadnock Golf Club
Hampton Roads Golf Club	Lake Placid Co.	Monosnoe Country Club
Happy Hollow Golf Club	Lake Shore Country Club	Montauk Club
Harlem Golf Club	Lakeside Country Club	Moon Brook Country Club
Harrisburg Country Club	Lake Toxaway Inn Club	Morris County Golf Club
Hartford Golf Club	Lakeview Golf Club	Mountain Lodge (Golf Course)
Hatherly Golf Club	Lakewood Country Club	Mountain Park Hotel Golf Course
Hay Harbor Club	Lambton Golf and Country Club	Mountain Ridge Golf Club
Hazelden Golf Club	Lancaster Country Club	Mt. Arlington Golf Course
Highland, Mass., Country Club	Langhorne Country Club	Mt. Diablo Park Club
Highland, Conn., Country Club	La Porte Country Club	Mt. Kisco Golf Club
Highland Golf Club	Lawrence Country Club	Mt. Lebanon Country Club
Highlands Country Club	Lawrenceville School (Golf Course)	Mt. Pleasant Golf Club
Hillcrest Country Club	Lebanon Country Club	Mt. Royal Tennis Club
Hill School Golf Club	Lenox Golf Club	Mt. Tom Golf Club
Hinsdale Golf Club	Les Cheneaux Club	Mt. Vernon Country Club
Hollywood Golf Club	Lexington Golf Club	Muskegon Country Club
Holyoke Golf Club	Lido Golf Club	Muskegon Country Club
Homestead Country Club	Lincoln Country Club	Myopia Hunt Club
Homewood Country Club	Lincoln Park Golf Club	Nashville Country Club
Hoosie Falls Country Club	Links Golf Club	Nashua Country Club
Hoosie-Whisick Club	Linwood Country Club	Nassau Country Club
Hornell Golf Club	Little Falls Country Club	National Golf Course
Hotchkiss School Golf Club	Lockmoor Club	Naugatuck Golf Club
Hotel Del Monte	Log Cabin Club	New Bedford Country Club
Houston Country Club	London Hunt and Country Club	New Britain Golf Club
Hudson River Country Club	Long Meadow Golf Club	New Canaan Country Club
Huntington Bay Club	Longwood Cricket Club	Newfoundland Lawn Tennis Club
Huntington Country Club	Los Angeles Country Club	New Haven Country Club
Huntington Valley Country Club	Losantiville Country Club	Newport Golf Club
Hyannisport Golf Club	Louisville Country Club	Newton Golf Club
Hyde Park Country Club	Lowden, F. O. (Golf Course)	Niagara Falls Country Club
Hyperion Field & Motor Club	Mahoning Golf Club	Norfolk Country Club
Idlewild Country Club	Mahopae Golf Club	Norfolk Golf Club
Illini Country Club	Marietta Country Club	Normandie Golf Club
Indiana Country Club	Maidstone Club	Northampton Country Club
Indiana Springs Co.	Mantour Heights Country Club	No. Andover Country Club
Indian Hill Club	Maplewood Golf Club	North Fork Company
Indianapolis Country Club	Marion Golf Club	North Hempstead Country Club
Inglewood Country Club	Mayfield Country Club	North Hills Country Club
Interlaken Country Club	Maywood Golf Club	North Jersey Country Club
Intervale Country Club	Meadowbrook Golf Club	Northland Country Club
Inverness Country Club	Meadow Heights Country Club	North Shore Country Club
Inwood Country Club	Meadville Country Club	Norwich Golf Club
Irondequoit Country Club	Meceola Country Club	Norwood Golf Club
Island Golf Club	Megunticook Golf Course	Oak Hill Country Club
Islip Tennis Club	Menlo Country Club	Oakland Hills Country Club
Jamaica Country Club	Merion Cricket Club	Oakley Country Club
Jamestown Golf and Country Club	Merrimac Valley Country Club	Oakmont Country Club
Jefferson County Golf & Country Club	Merrywold Park Golf Course	Oak Park Country Club
Joy Estate, Jas. F.	Meshingomesia Country Club	Oakwood Club
Kahkwa Country Club	Metacomet Golf Club	Oconomowoc Country Club
Kalamazoo Country Club	Mexico Country Club	Ogdensburgh Country Club
Kanawaki Golf Club	Miami Valley Golf Club	Old Elm Club
Kane Country Club	Midland Country Club	Old Lime Country Club
Kansas City Country Club	Midland Valley Country Club	Old York Road Country Club
Kearsarge Golf Club	Midlothian Country Club	Olympia Fields Country Club
Kendallville Golf Club	Milburn Country Club	Omaha Country Club
Kent Country Club	Milwaukee Country Club	Omaha Field Club
Kernwood Country Club	Minikahda Club	Onondaga Golf & Country Club
Keswick Golf Course	Minnehaha Country Club	Onteora Golf Club
Kettle Cove Golf Club	Mission Hills Country Club	Onwentsia Club
Kingswood Golf Club	Mississauga Golf Club	Orange County Golf Club
Knickerbocker Country Club	Mississinewa Club	Orange Tennis Club
La Crosse Country Club	Moberly Country Club	Oswaco Country Club

*Carters Tested Seeds, New York, London, Toronto*

- Ottawa Golf Club  
 Ould Newbury Golf Club  
 Owasco Country Club  
 Oxford Country Club  
 Parkersburg Country Club  
 Park Ridge Country Club  
 Passaconway Golf Course  
 Paul Smiths Hotel Golf Course  
 Payne-Whitney Estate  
 Petersham Golf Club  
 Philadelphia Country Club  
 Philadelphia Cricket Club  
 Philmont Country Club  
 Pike Golf Course  
 Pine Grove Golf Club  
 Pine Grove Springs Golf Club  
 Pine Orchard Golf Club  
 Pine Valley Country Club  
 Piping Rock Country Club  
 Pittsburgh Field Club  
 Pittsfield Country Club  
 Plainfield Country Club  
 Plymouth Country Club  
 Pocasset Golf Club  
 Point Judith Country Club  
 Portage Country Club  
 Portage Lake Golf Club  
 Pottsville Country Club  
 Powelton Club  
 Princess Ann Country Club  
 Princeton Country Club  
 Princeton Golf Club  
 Profile House Golf Course  
 Prouts Neck Golf Club  
 Putnam Country Club  
 Quacker Ridge Golf Club  
 Quebec Lawn Tennis Club  
 Quincy Country Club  
 Race Brook Country Club  
 Race Brook Realty Co.  
 Racine Country Club  
 Racine Park Dept.  
 Rainier Golf & Country Club  
 Raleigh Golf Club  
 Rangeley Golf Club  
 Ravisloe Country Club  
 Redford Country Club  
 Red Run Golf Club  
 Reservation Golf Club  
 Rhode Island Country Club  
 Richmond County Country Club  
 Ricker Hotel Golf Courses  
 Ridgefield Country Club  
 Ridgemoor Golf Club  
 Rivermead Golf Club  
 Rivertown Country Club  
 Riverview Golf Club  
 Rochester Country Club  
 Rockford Country Club  
 Rockingham Country Club  
 Rock Island Arsenal Golf Club  
 Rockport Country Club  
 Round Island Co. Golf Club  
 Roxborough Country Club  
 Ryan, Thomas F. Estate  
 Sacandaga Park Golf Club  
 Sadaquada Golf Club  
 Sakonnet Golf Club  
 Salem Golf Club  
 Salisbury Links  
 Salt Lake City Country Club  
 Saratoga Golf Club  
 Saucon Country Club  
 Scarborough Golf Club  
 Searsdale Golf and Country Club  
 Schroom Lake (Golf Course)  
 Schuylkill Country Club  
 Scioto Country Club  
 Scituate Country Club  
 Seabright Lawn Tennis Club  
 Seattle Golf Club  
 Seaview Golf Club  
 Segregansett Country Club  
 Sequin Golf Club  
 Shaker Heights Country Club  
 Sharon Golf Club  
 Shawnee Country Club  
 Sheboygan Country Club  
 Sheldrake Springs Golf Club  
 Shenecossett Country Club  
 Shinnecock Hills Golf Club  
 Shuttle Meadow Country Club  
 Siasconsett Country Club  
 Sidney Country Club  
 Sioux City Boat Club  
 Siwanoy Country Club  
 Skokie Country Club  
 Sleepy Hollow Club  
 Soangetaha Club  
 Somerset Hills Country Club  
 Somerville Country Club  
 Sound Beach Golf Club  
 South Bend Country Club  
 Southboro Golf Club  
 South Grove Golf Course  
 South Orange Field Club  
 South Shore Country Club  
 South Shore Field Club  
 Springfield, Ill., Country Club  
 Springfield, Mass., Country Club  
 Springfield, Ohio, Country Club  
 Springhaven Country Club  
 Spring Lake, Mich., Country Club  
 Spring Lake, N. J., Country Club  
 St. Albans Golf Club  
 St. Francis Golf Club  
 St. Georges Golf & Country Club  
 St. Joseph Country Club  
 St. Louis Country Club  
 St. Paul's School Golf Course  
 St. Regis River Golf Club  
 Stanton Heights Golf Club  
 Stockbridge Golf Club  
 Suburban Golf Club  
 Sunningdale Country Club  
 Sunset Hill Country Club  
 Sylvania Golf Club  
 Tacoma Golf and Country Club  
 Taconic Club  
 Tatnuck Country Club  
 Tedesco Country Club  
 Teoko Country Club  
 Terra Haute Country Club  
 Teugega Country Club  
 The Chicago Club  
 The Country Club (Brookline)  
 The Country Club of Virginia  
 Thornburg Country Club  
 Thorney Lea Golf Club  
 Thousand Islands Country Club  
 Titusville Country Club  
 Toledo Country Club  
 Topeka County Club  
 Toronto Golf Club  
 Toy Town Tavern (Golf Course)  
 Trenton Country Club  
 Tualitin Country Club  
 Tuxedo Golf Club  
 Utica Golf & Country Club  
 Union City Country Club  
 United Shoe Machin'y Ass'n Golf Club  
 University Club  
 University of Illinois Golf Club  
 Upper Montclair Golf Club  
 Vesper Country Club  
 Victoria Club  
 Wallingford Country Club  
 Wanakah Country Club  
 Wannamoisett Country Club  
 Warren Farm Golf Club  
 Washington County Golf & Country Club  
 Washington University  
 Washtenaw Country Club  
 Waumbeck Golf Club  
 Waumpatuck Golf Club  
 Waveland Golf Links  
 Waverly Golf Club  
 Weatogue Country Club  
 Webhamet Golf Club  
 Wee Burn Golf Club  
 Wellesley Country Club  
 Wellesley Farms Golf Club  
 Wellsville Country Club  
 Wentworth Golf Course  
 Westbrook Country Club  
 Westbrook Golf Club  
 Westfield Golf Club  
 Westhampton Golf Club  
 Westmoreland Country Club, Ill.  
 Westmoreland Country Club, Pa.  
 Westport Country Club  
 Westward-Ho Golf Club  
 Westwood Country Club  
 Westwood Golf Club  
 Wheatley Hills Golf Club  
 Wheaton Golf Club  
 Wheeling Country Club  
 Whitemarsh Valley Country Club  
 Wichita Falls Golf Club  
 Willowick Country Club  
 Wilmington Country Club  
 Winchester Country Club  
 Windsor Golf Club  
 Winnetka Country Club  
 Winnipeg Golf Club  
 Wollaston Golf Club  
 Woodbury Country Club  
 Woodland Golf Club  
 Woodmere Country Club  
 Woods Hole Golf Club  
 Woodstock Club  
 Woodway Country Club  
 Worcester Country Club  
 Wyantenuck Golf Club  
 Wykagyl Country Club  
 Wyoming Valley Country Club  
 Yahnundasis Golf Club  
 Yale Golf Club  
 York Harbor Country Club  
 Youghiogheny Country Club  
 Youngstown Country Club  
 Yountakah Country Club

## Tabulated Information Regarding Materials Used in

NAME	DESCRIPTION	AMOUNT PER ACRE	WHEN TO SOW	HOW TO SOW
Carters Complete Grass Fertilizer, No. 1	Complete Grass Food	4 ozs. per square yard	Spring or Autumn	Broadcast, mixed with sand or sifted soil
Carters Anticlover Fertilizer, No. 2				
Carters General Purpose Fertilizer, No. 3		600 lbs. per acre		
Dried Blood, pure..	Nitrogenous	200 to 300 lbs. ...	Late Winter or Early Spring	Broadcast ... ..
Hoof or Horn Powder	" .. "	" .. "	Autumn, Winter, and Early Spring	" ... ..
Nitrate of Soda	" ..	Not exceeding 150 lbs. ... ..	Spring ... ..	" ... ..
Rape Dust ... ..	" ..	400 to 600 lbs. ...	Autumn, Winter, and Early Spring	" ... ..
Sulphate of Ammonia	" ..	100 to 150 lbs. ...	Spring ... ..	" ... ..
Soot ... ..	" ..	500 to 750 lbs. ...	" ... ..	" ... ..
Malt Culms or Kiln Dust	" ..	600 to 1,000 lbs....	Spring or Autumn	" ... ..
Stable Manure, fresh	General ..	20 to 40 tons ...	When preparing the ground	Spread over the surface, and dig or plough it in to a depth not exceeding 3 in., so that it becomes incorporated with the surface soil and not buried deeply.
Farmyard Manure, fresh				
Stable Manure, rotted				
Farmyard Manure, rotted				
Peat Moss Manure..				
Basic Slag ... ..	Phosphatic .	400 to 800 lbs. ...	Autumn or Winter	Broadcast ... ..
Superphosphate ...	" ...	200 to 400 lbs. ...	Early Spring ...	" ... ..
Bone Meal ... ..	Phosphatic & Nitrogenous	500 to 600 lbs. ...	Autumn or Winter	Broadcast ... ..
Bones, Dissolved (pure bones and acid)	" "	200 to 400 lbs. ...	Autumn, Winter, and Spring	" ... ..
Bones, ¼, ½, and 1 inch ... ..	" "	500 to 600 lbs. ...	Autumn ... ..	Broadcast. Harrow or plough in
Guano, Dissolved ..	" "	300 to 400 lbs. ...	Autumn or Spring	Broadcast ... ..
Guano, Fish ... ..	" "	400 to 500 lbs. ...	Autumn, Winter, or Spring	" ... ..
Guano, Peruvian ..	" "	200 to 400 lbs. ...	Spring ... ..	" ... ..
Potash, Muriate of..	Potash ...	50 to 100 lbs. ...	Autumn, Winter and Early Spring	" ... ..
Potash Sulphate of	" "	" " "	" " "	" ... ..
Kainit .... ..	" "	200 to 400 lbs. ...	" " "	" ... ..

*Carters Tested Seeds, New York, London, Toronto*

# The Production and Maintenance of Golfing Turf.

ACTION	ENCOURAGES	IMPROVES	REMARKS
Fairly rapid and lasting	Grasses ... ..	All soils ... ..	Valuable, especially when used in conjunction with composts.
Rapid and steady	Grasses rather than Clovers	" ... ..	Valuable for eliminating clover and reviving turf exhausted by the wear and tear of a hot dry summer.
Steady and lasting	Grasses ... ..	" ... ..	Valuable for dressing golf courses through the green.
Gradual ... ..	" ... ..	Sandy loams ...	Valuable.
" ... ..	" ... ..	Light soils ...	"
Very quick, lasts only one season	" ... ..	All soils, especially retentive soils	"
Gradual ... ..	" ... ..	All soils ... ..	Valuable, especially for top-dressing young grass and newly-sown greens.
Fairly rapid ...	Grasses rather than Clovers	" ... ..	Valuable, provided that the soil contains a substantial quantity of lime.
Quick ... ..	Grasses especially	" ... ..	Valuable, but unsightly to use, as it remains on the surface for a long time.
" ... ..	Grasses ... ..	" ... ..	Valuable, especially for top-dressing young grass and newly-sown greens.
Quick, gentle, and lasting	" ... ..	All soils, especially heavy clays	Valuable, both for digging in the ground and for making rich top-dressing composts.
" "	" ... ..	All soils ... ..	" " " " "
" "	" ... ..	" ... ..	" " " " "
" "	" ... ..	" ... ..	" " " " "
" "	" ... ..	All soils, especially light sandy soils	Valuable for digging in, but is not so good as straw manure for making rich top-dressing composts.
Gradual and steady	Clovers and Grasses	Peaty, heavy, and organic soils	Good for soils deficient in lime.
Quick ... ..	" " "	All, except sour soils	Better than slag for soil rich in lime.
Gradual and steady	" " "	Light soils ...	Rather dangerous to use, because under certain circumstances they will produce a thick crop of clover in turf apparently free from clover.
Quick ... ..	" " "	Light soils, stiff calcareous or damp	
Slow. Has effect for about 7 years	" " "	Light soils ...	
Quick ... ..	" " "	Almost all soils ...	Valuable.
" ... ..	" " "	All soils ... ..	"
" ... ..	" " "	" ... ..	"
Gradual and lasting	" " "	Light soils ...	"
" "	" " "	" ... ..	"
Gradual ... ..	" " "	" ... ..	Gives best results if mixed with Guano or other Nitrogenous and Phosphatic Manure.





Tabulated Information Regarding Materials Used in

NAME	DESCRIPTION	AMOUNT PER ACRE	WHEN TO SOW	HOW TO SOW
Carters Complete Grass Fertilizer, No. 1	Complete Grass Food	4 ozs. per square yard	Spring or Autumn	Broadcast, mixed with sand or sifted soil
Carters Anticlover Fertilizer, No. 2				
Carters General Purpose Fertilizer, No. 3				
Dried Blood, pure..	Nitrogenous	200 to 300 lbs. ...	Late Winter or Early Spring	Broadcast ... ..
Hoof or Horn Powder	" ..	" ..	Autumn, Winter, and Early Spring	" .. ..
Nitrate of Soda	" ..	Not exceeding 150 lbs. ....	Spring ... ..	" .. ..
Rape Dust ... ..	" ..	400 to 600 lbs. ...	Autumn, Winter, and Early Spring	" .. ..
Sulphate of Ammonia	" ..	100 to 150 lbs. ...	Spring ... ..	" .. ..
Soot ... ..	" ..	500 to 750 lbs. ...	" .. ..	" .. ..
Malt Culms or Kiln Dust	" ..	600 to 1,000 lbs....	Spring or Autumn	" .. ..
Stable Manure, fresh	General ..	20 to 40 tons ...	When preparing the ground	Spread over the surface, and dig or plough it in to a depth not exceeding 3 in., so that it becomes incorporated with the surface soil and not buried deeply.
Farmyard Manure, fresh				
Stable Manure, rotted				
Farmyard Manure, rotted				
Peat Moss Manure..				
Basic Slag ... ..	Phosphatic ..	400 to 800 lbs. ...	Autumn or Winter	Broadcast ... ..
Superphosphate ...	" ..	200 to 400 lbs. ...	Early Spring ...	" .. ..
Bone Meal ... ..	Phosphatic & Nitrogenous	500 to 600 lbs. ...	Autumn or Winter	Broadcast ... ..
Bones, Dissolved (pure bones and acid)	" "	200 to 400 lbs. ...	Autumn, Winter, and Spring	" .. ..
Bones, 1/4, 1/2, and 1 inch ... ..	" "	500 to 600 lbs. ...	Autumn ... ..	Broadcast. Harrow or plough in
Guano, Dissolved ..	" "	200 to 400 lbs. ...	Autumn or Spring	Broadcast ... ..
Guano, Fish ... ..	" "	400 to 500 lbs. ...	Autumn, Winter, or Spring	" .. ..
Guano, Peruvian ..	" "	200 to 400 lbs. ...	Spring ... ..	" .. ..
Potash, Muriate of..	Potash ...	50 to 100 lbs. ...	Autumn, Winter and Early Spring	" .. ..
Potash Sulphate of	" "	" ..	" " "	" .. ..
Kainit ... ..	" "	200 to 400 lbs. ...	" " "	" .. ..

the Production and Maintenance of Golfing Turf.

ACTION	ENCOURAGES	IMPROVES	REMARKS
Fairly rapid and lasting	Grasses ... ..	All soils ... ..	Valuable, especially when used in conjunction with composts.
Rapid and steady	Grasses rather than Clovers	" .. ..	Valuable for eliminating clover and reviving turf exhausted by the wear and tear of a hot dry summer.
Steady and lasting	Grasses ... ..	" .. ..	Valuable for dressing golf courses through the green.
Gradual ... ..	" .. ..	Sandy loams ...	Valuable.
" .. ..	" .. ..	Light soils ...	"
Very quick, lasts only one season	" .. ..	All soils, especially retentive soils	"
Gradual ... ..	" .. ..	All soils ... ..	Valuable, especially for top-dressing young grass and newly-sown greens.
Fairly rapid ...	Grasses rather than Clovers	" .. ..	Valuable, provided that the soil contains a substantial quantity of lime.
Quick ... ..	Grasses especially	" .. ..	Valuable, but unsightly to use, as it remains on the surface for a long time.
" .. ..	Grasses ... ..	" .. ..	Valuable, especially for top-dressing young grass and newly-sown greens.
Quick, gentle, and lasting	" .. ..	All soils, especially heavy clays	Valuable, both for digging in the ground and for making rich top-dressing composts.
" "	" .. ..	All soils ... ..	" " " " "
" "	" .. ..	" .. ..	" " " " "
" "	" .. ..	" .. ..	" " " " "
" "	" .. ..	All soils, especially light sandy soils	Valuable for digging in, but is not so good as straw manure for making rich top-dressing composts.
Gradual and steady	Clovers and Grasses	Peaty, heavy, and organic soils	Good for soils deficient in lime.
Quick ... ..	" " "	All, except sour soils	Better than slag for soil rich in lime.
Gradual and steady	" " "	Light soils ...	Rather dangerous to use, because under certain circumstances they will produce a thick crop of clover in turf apparently free from clover.
Quick ... ..	" " "	Light soils, stiff calcareous or damp	
Slow. Has effect for about 7 years	" " "	Light soils ...	Valuable.
Quick ... ..	" " "	Almost all soils ...	
" .. ..	" " "	All soils ... ..	"
" .. ..	" " "	" .. ..	"
Gradual and lasting	" " "	Light soils ...	"
" "	" " "	" .. ..	"
Gradual ... ..	" " "	" .. ..	Gives best results if mixed with Guano or other Nitrogenous and Phosphatic Manure.

NAME	DESCRIPTION	AMOUNT PER ACRE	WHEN TO SOW	HOW TO SOW
Wood Ashes ...	Potash and Phosphatic	50 bushels ...	Spring and Autumn	Broadcast ... ..
Gypsum ... ..	Calcareous .	1000 to 15000 lbs.	Autumn ... ..	" ... ..
Lime, Carbonate of	" ...	1 to 2 tons ...	" ... ..	Harrow in ... ..
Lime, Quick ...	" ...	500 to 1000 lbs. if finely ground	" ... ..	Slake, Broadcast ... ..
Lime, Gas ... ..	" ...	2 to 5 tons ...	" ... ..	Expose to weather for several months, broadcast and harrow in
Pulverized Chalk ...	" ...	2 tons ... ..	" ... ..	Broadcast, and harrow in ...
Charcoal ... ..	Of little Man- urial value	200 to 300 lbs. ... 20 by 20 yards	" ... ..	Broadcast, and rub in with back of rake
Sand ... ..	Cannot be classed as a manure	2 tons per green, 20 by 20 yards	" ... ..	Broadcast, and rub in with back of iron rake
Shell Compost ...	" " }	200 lbs. per green, 20 by 20 yards, 1 ton per acre	Autumn, Winter and Early Spring	{ Broadcast ... ..
Carbon Sand ...	" " }			{ Broadcast, and roll in ...
Leaf Mould ... ..	Of little man- urial value	1 cart-load per green, 20 by 20 yards	Autumn or Spring	Sift fine, and broadcast ...
Rex Humus.....	A fertilizing Top-dressing.	See page 19	Any time from April to October.	Broadcast



*Carters Tested Seeds, New York, London, Toronto*

ACTION			ENCOURAGES	IMPROVES	REMARKS
ow	...	...	Grasses ...	All soils ...	Difficult to obtain enough for practical use.
"	...	...	Clovers and Grasses	Soils poor in limes and sulphates	—
"	...	...	" " "	Light soils ...	Never mix with Sulphate of Ammonia or similar compounds. Releases other ingredients in soil and improves the physical nature of heavy sour soils.
ompt	...	...	" " "	Heavy soils ...	
ow	...	...	" " "	Verminous soils...	Less valuable than either of the above. Somewhat dangerous to use, as it contains compounds poisonous to plant life, unless well exposed to the weather.
"	...	...	" " "	Soils poor in limes, or heavy, wet, or sour soils	Improves mossy or foggy turf.
mechanical	..	A clean growth ..		All sticky soils ...	Used for making a firm, dry, porous surface.
"	...	" " "		" " "	Used for making a firm, dry, porous surface, and for fining down a too vigorous growth.
"	...	" " "		All soils ...	Sweetening soil and eliminating moss.
"	...	A clean fine growth		All sticky or soft soils	Used for making a firm, dry, porous surface; it is a good substitute for sand.
"	...	Grasses ...		Thin or light soils, deficient in humus	Better if used as part of a compost.
"	...	A fine thick growth.		All soils.	A most useful substitute for prepared composts.



*Carters Tested Seeds, New York, London, Toronto*



NAME	DESCRIPTION	AMOUNT PER ACRE	WHEN TO SOW	HOW TO SOW
Wood Ashes ...	Potash and Phosphatic	50 bushels ...	Spring and Autumn	Broadcast ... ..
Gypsum ... ..	Calcareous	1000 to 15000 lbs.	Autumn ... ..	" ... ..
Lime, Carbonate of	" ...	1 to 2 tons ...	" ... ..	Harrow in ... ..
Lime, Quick ...	" ...	500 to 1000 lbs. if finely ground	" ... ..	Slake, Broadcast ... ..
Lime, Gas ... ..	" ...	2 to 5 tons ...	" ... ..	Expose to weather for several months, broadcast and harrow in
Pulverized Chalk ...	" ...	2 tons ... ..	" ... ..	Broadcast, and harrow in ...
Charcoal ... ..	Of little Man- urial value	200 to 300 lbs. ... 20 by 20 yards	" ... ..	Broadcast, and rub in with back of rake
Sand ... ..	Cannot be classed as a manure	2 tons per green, 20 by 20 yards	" ... ..	Broadcast, and rub in with back of iron rake
Shell Compost ...	" " }	200 lbs. per green, 20 by 20 yards, 1 ton per acre	Autumn, Winter and Early Spring	{ Broadcast ... .. { Broadcast, and roll in ...
Carbon Sand ...	" " }			
Leaf Mould ... ..	Of little man- urial value	1 cart-load per green, 20 by 20 yards	Autumn or Spring	Sift fine, and broadcast ...
Rex Humus.....	A fertilizing Top-dressing.	See page 19	Any time from April to October.	Broadcast

ACTION	ENCOURAGES	IMPROVES	REMARKS
Slow ... ..	Grasses ... ..	All soils ... ..	Difficult to obtain enough for practical use.
" ... ..	Clovers and Grasses	Soils poor in limes and sulphates	
" ... ..	" " "	Light soils ...	Never mix with Sulphate of Ammonia or similar compounds. Releases other ingredients in soil and improves the physical nature of heavy sour soils.
Prompt ... ..	" " "	Heavy soils ...	
Slow ... ..	" " "	Verminous soils...	Less valuable than either of the above. Somewhat dangerous to use, as it contains compounds poisonous to plant life, unless well exposed to the weather.
" ... ..	" " "	Soils poor in limes, or heavy, wet, or sour soils	Improves mossy or foggy turf.
Mechanical ...	A clean growth ..	All sticky soils ...	Used for making a firm, dry, porous surface.
" ... ..	" " "	" " ...	Used for making a firm, dry, porous surface, and for fining down a too vigorous growth.
" ... ..	" " "	All soils ... ..	Sweetening soil and eliminating moss.
" ... ..	A clean fine growth	All sticky or soft soils	Used for making a firm, dry, porous surface; it is a good substitute for sand.
" ... ..	Grasses ... ..	Thin or light soils, deficient in humus	Better if used as part of a compost.
" ... ..	A fine thick growth.	All soils.	A most useful substitute for prepared composts.



Carters Tested Seeds, New York, London, Toronto



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